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DRAFT

**CHOICES FOR
MISSION BAY**
**Planning Considerations
and Alternative Plans**

**Mission Bay
San Francisco**

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DRAFT

CHOICES FOR
MISSION BAY
Planning Considerations
and Alternative Plans

Mission Bay
San Francisco

~~for the~~ City and County of
San Francisco Planning Department

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1.0 Introduction

I.0 INTRODUCTION AND SUMMARY

This report identifies the basic determinants that influence the physical form and design character of Mission Bay, outlines a range of land uses that should be considered for the site, and presents three alternative land use plans to illustrate the possibilities for shaping development. This work is submitted to the City Planning Commission, to residents of the City and other affected parties. Considered the starting point for planning, the report is intended for public review of the fundamental choices for development and to stimulate public debate over Mission Bay's future.

This work follows the publication of two earlier reports, the Background and Preliminary Findings Report, Draft Working Paper, November 8, 1985 and Objectives and Policies, Proposal for Citizen Review, December 30, 1985. In the first report, existing conditions of the site and its environs were identified, along with existing principles and objectives established by the public agencies, community interests that apply to the site, and current opportunities and constraints affecting the site. The second report included objectives and policies intended to act as general guides for planning Mission Bay. While the content of the earlier reports provide a framework for succeeding work, both will continue to be refined or modified as appropriate, based upon public comment and further analysis.

The land use alternatives in this report are illustrative plans prepared to test whether all the identified objectives and policies can be implemented in a physical sense. They represent different overall design concepts and different combinations of choices on the basic plan determinants identified within the report. After extensive discussion and reaction to these alternatives, an initial Mission Bay Plan will be drafted by the Department. Clearly, reaction to these land use alternatives, and the choices expressed by public and community interests, will strongly guide the Department in plan preparation.

Once the Mission Bay Plan has been drafted, both objectives and policies and the Plan itself will undergo an analysis of environmental and fiscal impacts on the City. Any adverse consequences brought about by proposed objectives and policies

1.0 INTRODUCTION AND SUMMARY

or Plan will be analyzed and presented in the Mission Bay Environmental Impact Report (EIR). Mitigation measures will be considered as part of that process. After a thorough public review and any plan modifications have been made, the objectives and plan will be presented to the City Planning Commission for its consideration. Required City actions, including the anticipated development agreement, will clarify how mitigation of any adverse impacts is to be achieved. Beyond the City Planning Commission, the matter will be subject to Board of Supervisors action, with any final legislation requiring the Mayor's signature.

The Background for Planning

Cities do not remain static and must adapt to new functions and uses in order to retain their social and economic vitality. Mission Bay itself is an example of how areas within a city experience the effects of urban change and economic trends. But change at Mission Bay also brings a unique opportunity for San Francisco. The City should take full advantage of the circumstances and consider Mission Bay as a resource.

Mission Bay's nearly 300 acres of land and water can be developed and enhanced with relatively little displacement of existing uses. There are no other nearly undeveloped, comparably-sized and situated lands within San Francisco. With a site of this size, a neighborhood of new and desirable character can be comprehensively planned. Because all private lands are held by a single project sponsor, a city-adopted plan, which takes into consideration the public goals and private expectations for the area, has excellent prospects for full implementation over time.

The site's close proximity to Downtown suggests opportunities for both commercial activity complementary to the Downtown, and for housing within walking distance or a short transit ride to employment centers. Research and development activity, a use to be further defined and explored as a new sector of the city's economy, is compatible with neighboring industrial and maritime uses. Comprehensive planning of the area can provide an open space system both serving a new community and making optimum use of the extensive China Basin Channel

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shoreline. An appropriate mix of revenue-producing uses can be included within the development to help subsidize needed public infrastructure and public benefits desired from the project.

In this report, the range of uses set forth in the land use program is guided by the Mayor's letter of October 16, 1984 to the Southern Pacific Land Company, the predecessors in interest of Santa Fe Pacific Realty Corporation, owner of much of the Mission Bay land. The letter followed months of negotiation between the Mayor's Office, including the Department of City Planning, and Santa Fe Southern Pacific Corporation. The Mayor announced her support for a project that included at least 7,577 residential units, and up to 4.1 million square feet of office space, 2.6 million square feet of research and development space, and 200,000 square feet of retail space; no buildings would be over eight stories, and the land uses, open space, and waterways were to be sited as per the earlier Southern Pacific site plan.

These negotiations resulted in a project vastly scaled down, yet feasible to the project sponsors. The previous Southern Pacific proposal had been for 7,000 residential units, 11.7 million square feet of office space, 4.3 million square feet of research and development space, 500,000 square feet of retail and hotel space, and building heights up to 42 stories.

The program contained in the Mayor's letter is understood to be for the present time the balance necessary between residential and commercial development to ensure that revenue from the project is available to help subsidize infrastructure, community services, open space and affordable housing requirements on the site.

The range of land uses outlined in this report has not been evaluated from the standpoint of economics. Though the City is neither in a position nor intends to determine what makes the project profitable for Santa Fe Pacific Realty Company, economic information is expected to be developed in order to evaluate planning decisions and guide negotiations of a development agreement with the project sponsor. Economic information, plus a method of evaluation, is now in preparation

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and will be available for consideration in conjunction with the review of a draft plan for Mission Bay.

The Department and its Mission Bay planning team have not assumed that the site plan is fixed by any previous efforts at planning Mission Bay. Public concerns expressed about prior plan configurations, as well as the Department's technical concerns over earlier plans, suggested a fresh start for the land use plan. The 1984 Santa Fe Pacific plan, and other plan concepts by the Mission Creek Conservancy, San Francisco Tomorrow, and Potrero League of Active Neighbors, have all been considered by the Department in preparing the land use alternatives of this report.

In addition to these matters, the site constraints discussed in the Background and Preliminary Findings Report should be noted. The soils underlying the site influence development substantially, as it is virtually all fill of the former Mission Bay and its marshes. As such, it is poor quality in general, which adds to construction costs and seismic concerns. Traffic around the site, on the I-280 Freeway and Third Street, renders some locations less desirable than others for housing. Further, as the I-280 Freeway ramps are cut back within the northern part of the site, more traffic at grade through the development will result. The utilities infrastructure in place at the site is not enough to serve the development, yet is sufficiently in place to add considerably to costs if certain segments of it are proposed for relocation. This includes the large sewage retention boxes under Channel and Berry Streets, and the large sewer pipes under Sixth and Owens Streets. These and other physical constraints are discussed in the earlier report.

Plan Determinants

The Plan Determinants chapter presents important decisions to be made in Mission Bay planning. Each plan determinant will help to solve part of the site planning efforts. Each part influences the basic physical pattern and the land use program to some extent. This report identifies and describes determinants considered key to any plan the City may ultimately propose. To implement the varying overall site design concepts, the determinants can be combined in a variety

I.0 INTRODUCTION AND SUMMARY

of ways. Some combinations may be more compatible than others. Presenting these determinants illuminates the fundamental choices in developing a Mission Bay Plan. The three illustrative land use plans included in this report portray potential combinations of these determinants in the context of overall design concepts for the site.

The determinants include (1) open space systems; (2) street grids; (3, 4, and 5) street arterials on the north, west and east; (6) rail transportation; (7) I-280 Freeway ramps; (8) Port activities each of Third Street; (9) wetlands; (10) housing; (11) retail; (12) secondary office; (13) research and development; (14) community facilities. These determinants are detailed below.

1. Open Space Systems—Creating parks and open space corridors, using the Channel and Bay
 - o Connect China Basin Channel at its midpoint (Fifth Street) to a formal canal/open space corridor running south through the middle of the site, then to the Bay;
 - o Connect Channel at its western end to a crescent-shaped canal/open space corridor reflecting the historic shoreline of Mission Bay as it circles around the site to the Bay;
 - o Link Channel with a central park near Fifth Street, with open space and/or a canal meandering through the site to the Bay; and
 - o Water quality considerations are discussed.
2. Street Grids—Establishing the street pattern south of the Channel
 - o Extend the South of Market grid south of the Channel, keeping present Sixth Street but perhaps shifting Third Street toward the Bay where it would loop around the site;

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- o Extend the Third Street north-south grid through the site; and
 - o Create a mixed grid by extending South of Market grid along Sixth Street, and the Third Street grid along the west side of the site, resolving conflicts in these grids at the interior of the site.
3. North of Channel Arterials—Accommodating heavy traffic and transit
- o Townsend Street could be two-way or part of a one-way couplet, with or without Muni-Metro and an underground Caltrain;
 - o King Street could be a major two-way boulevard or part of a one-way couplet, with or without Muni-Metro and an underground Caltrain; and
 - o Berry Street could be a local access street, or part of a one-way couplet with Muni-Metro.
4. West Side Arterials—Connections between south of the Channel and the north
- o Owens Street, right across the railroad tracks from Seventh Street, could run between the western edge of the site and a Caltrain station, relocated under the Freeway; and
 - o Sixth Street could include Muni-Metro.
5. East Side Arterials--A possible shift for Third Street
- o Keeping Third Street in its present alignment maintains the division of the site into east or west of Third Street; and
 - o Realigning Third Street along China Basin Street at the Bay edge unites the site, but at a cost.

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6. Rail Transportation—Caltrain commuter, Muni-Metro users, and freight
 - o Caltrans would like to extend the Caltrain to an underground station downtown if financing becomes available; the present station could be moved to Seventh and Channel Street or at Sixteenth Street, as a temporary or permanent station, with a right-of-way retained to either Townsend or King Streets for potential undergrounding later;
 - o The Caltrain station could be under either Townsend or King Street, at either Fourth or Second Streets, to be a way station if undergrounding to downtown were later achieved;
 - o The Muni-Metro/E Line Streetcar could be extended on Townsend or King Streets; if within a boulevard, most likely in the medium strip, and if within a one-way couplet, most likely on one side of the street;
 - o The Muni-Metro should cross the Channel at Owens or Sixth Street to serve the southern area, as the Third and Fourth Street Bridges have insufficient capacity to provide a separate transit right-of-way;
 - o The E Line should continue to Showplace Square, and the Muni-Metro down Owens or Sixth Street to Sixteenth Street;
 - o The Belt Line Freight Service serves the waterfront north of the Channel, and could be connected either via Townsend or King Streets, or via the Third Street Bridge with connections to Illinois or China Basin Streets; and
 - o The Central Waterfront freight connection from the rail mainline must come through the site from Seventh Street until either the Port constructs a planned drawbridge over Islais Creek or other

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options are found which enable a connection along Illinois Street.

7. I-280 Freeway Ramps—removing and rebuilding ramps
 - o The I-280 transfer concept program keeps the two Sixth and Brannan Street ramps (which block Sixth Street) and connects two new ramps toward The Embarcadero on King Street between Fifth and Sixth Streets;
 - o A revised four-ramp system moves the Sixth Street ramps to unblock the street, shifting one to Seventh Street, and brings the two ramps for The Embarcadero down between Sixth and Seventh Streets; and
 - o A two-ramp system sets one ramp down on Sixth Street, the other on Seventh, and does not direct--but does allow--traffic flow toward The Embarcadero.
8. Port Activities East of Third Street--Existing maritime uses, potential Container Terminal
 - o Present activity level would require some buffering; and
 - o A Container Terminal would use all land east of Third Street, following substantial condemnation efforts to acquire privately-held land, and preclude housing immediately west of Third Street.
9. Wetlands--A salt marsh habitat reflective of the past
 - o Beneath and east of the I-280 overpass at southwest end of Channel;
 - o Northwest side of Channel along Berry Street;
 - o Southeast side of Channel west of Fourth Street;

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- o Between Third and Fourth Streets; and
 - o Mouth of Channel near Pier 48.
10. Housing—A new San Francisco neighborhood
- o Relatively high density housing, to maximize housing contribution;
 - o Housing above neighborhood retail space;
 - o Family housing;
 - o Neighborhood open space;
 - o Housing at the perimeter of blocks, with continuous street frontages and multiple street entryways;
 - o Diverse housing types to serve a diverse community;
 - o Low-rise housing at greater than North Beach densities, about 60 units/acre, with three stories over wood-frame shared parking garages;
 - o Mid-rise housing at 120 units/acre, combining eight-story housing with low-rise housing over concrete, pile supported garage; higher density if all mid-rise;
 - o Densities can be increased by incorporating alleys within blocks to increase street frontages;
 - o Sample housing types are illustrated; and
 - o Houseboat/boat community locations are discussed.
11. Retail—Serving both employees and residents, helping to define the neighborhood
- o Retail north of the Channel adds interest to both employment areas and Channel edge;

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-
- o Retail south of the Channel can be the neighborhood shopping street;
 - o Retail along a public square or other open space can be a focus for neighborhood shopping and add interest and vitality to open spaces; and
 - o Retail along an arterial street can buffer adjoining housing from traffic.
12. Secondary Office--A revenue producer keeping entry-level jobs in the City
- o Predominantly eight-story buildings with large floors, with opportunities for ground level retail;
 - o Accessible by public transit, and accessible from Downtown and Mission Bay residential areas; and
 - o Open spaces should be integrated into office areas.
13. Research and Development (R&D)--The Bay Area's growth industry
- o Two- to four-story buildings, with high ceilings on first floors;
 - o Accessible by public transit, and from Mission Bay residential areas;
 - o Open spaces should be integrated into R&D areas; and
 - o Alternative R&D uses include large-scale retail, wholesale, light industrial, maritime, and light manufacturing and warehousing.

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14. Community Facilities—Serving the Mission Bay community

- o Community facilities can be located between different land uses, at public squares, on commercial streets, and at parks; and
- o Facilities to be considered include fire, police, school, health, mass care, child care, cultural arts, church, and library.

The Program

The land use program indicates the mix of uses, such as housing and retail, office and open space, and the amounts of such uses considered achievable within Mission Bay at this stage. It is expressed as a range and will be refined during the course of the work as site planning continues, as economic information is developed, as citizen and public agency comments are gathered and considered, and as discussions with the project sponsor continue.

The program is derived in part from the Department's assessment of San Francisco's future needs, as well as from the directions and constraints previously discussed and the Objectives and Policies published earlier. The program reflects fundamental planning principles, market and site conditions, and public concerns.

The Mission Bay land use program should provide opportunities for a variety of land uses and contribute to identifiable city needs. It must respond to existing physical conditions on and near the site in creating a new neighborhood and work place with associated amenities. A mixed use community can produce a net addition to San Francisco's housing stock, while establishing an advantageous position for the city to foster its job base and diversify its economy. The revenue flow from commercial development can support the infrastructure costs and community services needed for residents and workers. The commercial development will subsidize a portion of the housing to below market rates, and assist in providing an open space

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system that enhances the development and adds to the City's shoreline recreational opportunities.

The Mission Bay land use program range proposed by the Department is indicated below:

Table 1: Mission Bay Land Use Program

<u>Use</u>	<u>Acres</u>
Housing	86 to 96 acres (7,200 to 8,500 dwelling units)
Office	21 to 32 acres (3 to 4.5 million square feet)
R&D	24 to 36 acres 2 to 4 million square feet)
Maritime	0 to 50 acres
Retail	5 to 12 acres (300,000 to 600,000 square feet)
Public Open Space	67 to 95 acres*
Community Facilities	2 to 6 acres
Hotel	0 to 4 acres
Infrastructure and Unusable Land	55 to 60 acres
Totals	230 to 354 acres

* Includes public open space within housing, office and R&D acreage.

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The Land Use Alternatives

Three plans or concepts are included in this report to illustrate how land uses can be arrayed on the Mission Bay site. These illustrative plans follow from the Objectives and Policies and represent choices among overall site design concepts and the plan determinants, including land uses within the program range. From these alternatives or some combination of alternatives that may emerge during the course of public discussion, the Department expects to produce a plan for Mission Bay.

The alternative plans demonstrate the suitability of different portions of the site for different types of development. The alternatives, as can be seen in the report, have varying land use accounts. They show how different development patterns can vary the land use program for the site. The land use account for each alternative could be changed to some degree to reflect different priorities among uses and different trade-offs between density and cost of development. Thus, the land use programs within each alternative should not be considered fixed but points for discussion and further evaluation.

In addition, it is important to focus on the design of each of these illustrative plans. The design if implemented will become a permanent part of the San Francisco pattern that will endure as uses change and the land accommodates differing space needs. The challenge is to achieve a stellar design with a mix of land uses that benefits San Francisco and can be implemented by the project sponsor.

The illustrative land use plans, with open space networks and selected options, are presented on the following pages. Each plan can and should be evaluated to determine (1) how well the Objectives and Policies are met; (2) the ability of each plan to meet programmatic goals (3) the effectiveness of implementing various plan determinants and (4) the extent to which each design concept can achieve the vitality that will be a benefit to all San Francisco.

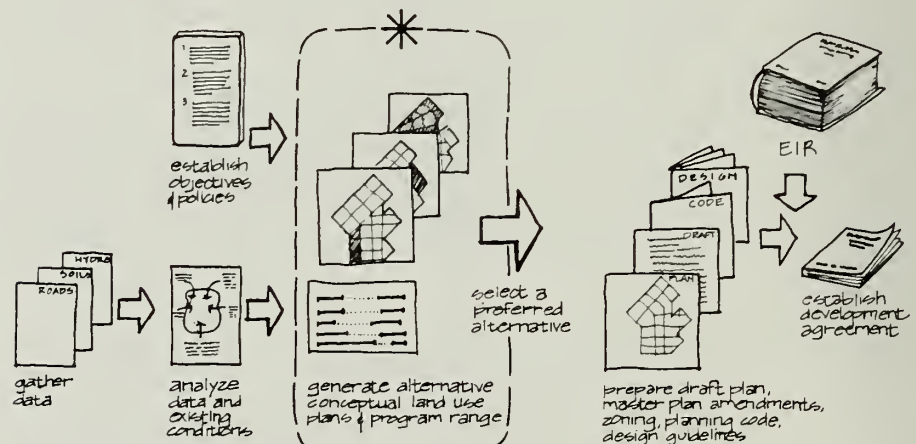
1.0 INTRODUCTION AND SUMMARY

Organization of This Report

This report is divided into three chapters, entitled Plan Determinants, Land Use Program and Illustrative Plans. Plan Determinants itemizes all of the planning factors that will influence the ultimate Mission Bay land use plan. The Land Use Program is then described. The types of land uses appropriate for Mission Bay and the range of acreage that would be most realistic for each use is set forth. Illustrative Plans show alternative ways that the programmed land uses can be arrayed on the site. They highlight in plan and text forms the various choices that still remain to be made about (1) character of Mission Bay, (2) the optimum amount of each land use, and (3) the best location for each use on the site.

The Ongoing Planning Process

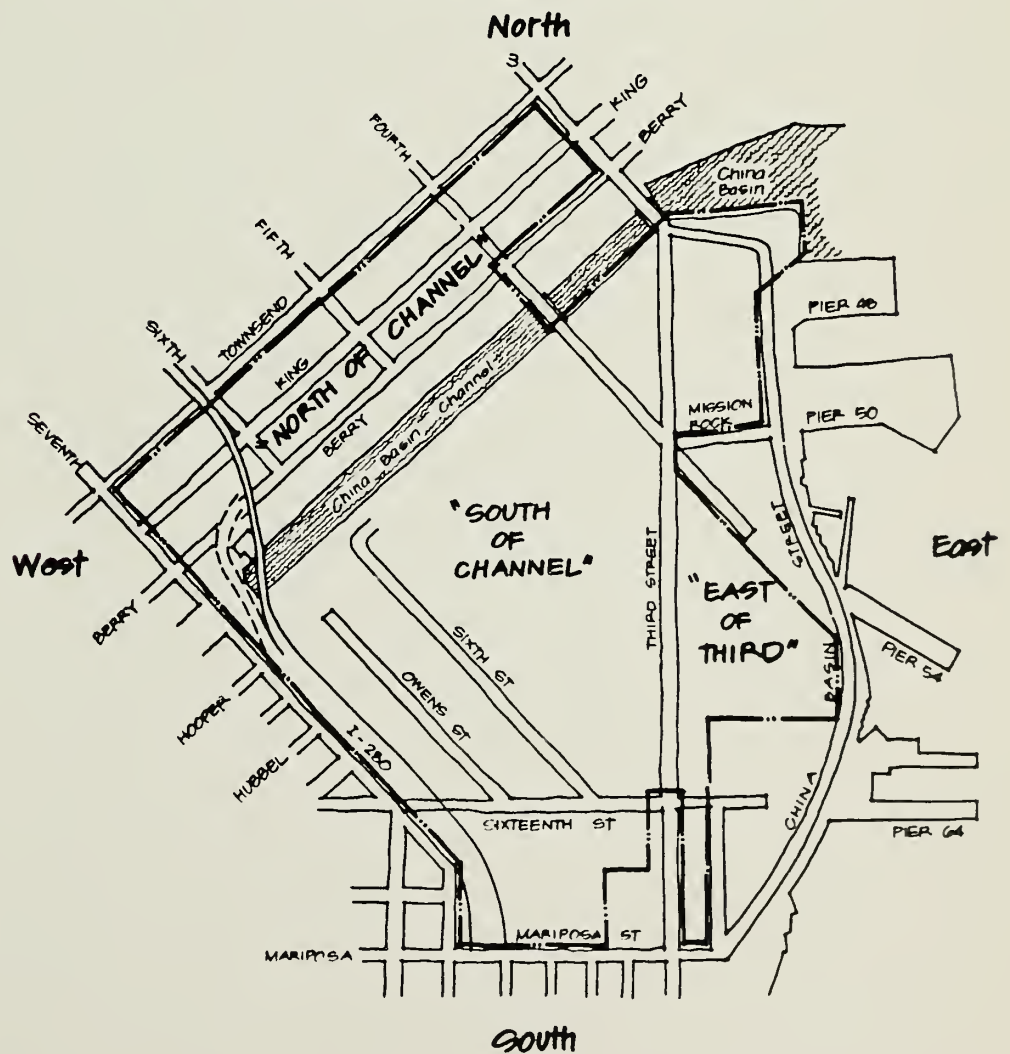
Following is a diagram showing the several phases of the Mission Bay planning process and the project's current status. The products to be provided during the process are noted.



Pertinent data has been gathered and analyzed; objectives and policies specifically for Mission Bay development have been prepared; plan determinants have been studied; and a recommended range for land uses, or program, has been

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produced. All of these have contributed to the preparation of land use plan alternatives. In design studio sessions, multiple plan concepts have been generated and evaluated. The three primary plans in Chapter 4.0 summarize in plan form the wide variety of choices remaining to be made. The characteristics, advantages and disadvantages of each plan are provided, to point out what can and cannot be achieved in realistic plans.



2.0 Plan Determinants

2.0 PLAN DETERMINANTS

Review of existing information and experimentation with various overall design concepts for site development has led to the identification of the planning factors that will influence the shape and form of the Mission Bay Master Plan. This section itemizes each influential factor, or "plan determinant," and explains what the choices are for solving each issue. Recommendations are not made because the different solutions have to be tailored to work with the to-be-selected overall design concept for the site (see Section 4.0). Nonetheless, a thorough explanation of the considerations to be made when choosing various plan determinant selections is presented. Review of these plan determinants and the broad program range in Section 3.0 provides the background for development and evaluation of the Illustrative Plan Alternatives shown in Section 4.0.

The two area-wide determinants, open space systems and street grid, are presented first because they addressed major means for organizing all land uses on the site. Other plan determinants, affecting only a part or parts of the site, follow. Near the end of the section as subsections about types of uses, providing generic siting criteria and discussing how they could be applied to this site. Background planning factors such as existing soils conditions or the utility infrastructure are not discussed herein because the extent to which they influence site planning was described in the Background and Findings Report (November 1985). They are however referred to when they are believed to affect the feasibility or desirability of solutions offered in this report.

in intro
duction

For reference while reading this report, a base map is provided on the following page. Street names and basic areas of the site are labeled and are later referred to in the text.

2.1 Open Space Systems

2.1.1 Open Space Planning Criteria

The quality of an open space system contributes directly to the quality of life in the urban environment. This is particularly true in residential neighborhoods. The open space system is a

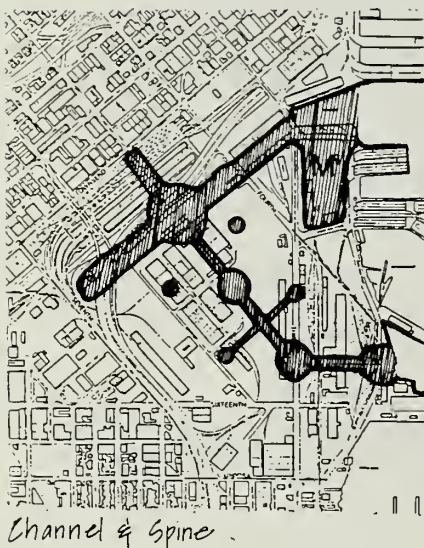
2.0 PLAN DETERMINANTS

- o It should be a hierarchical network or system with a variety of scales of spaces whose order is implicit in its visual form. As many land uses as possible should front on open space.
- o The open space system must assist in giving the development its overall image, tone and texture.
- o The system should visually and physically connect to major adjacent man-made and natural features (such as San Francisco Bay, China Basin Channel, Potrero Hill, the Downtown, South of Market, Showplace Square, and the Bay Bridge).
- o The major open space features should be physically framed and supported by the architecture and adjacent land uses, and vice versa.
- o It should reflect both historical and current cultural patterns and traditions.
- o Open space should serve a variety of roles, for active and passive recreation, enjoyment and use.
- o Pedestrian systems should be tied together through open space, separate from the vehicular circulation networks.

Following are the major options being examined for an open space system.

2.1.2 Channel and Central Spine

This system utilizes the existing China Basin Channel and a central open space spine as a major formal configuration. Its alignment reinforces the South of Market grid pattern. The canal is the primary visual element within the open space spine and could form a symbolic water link between the Channel and the Bay near Mission Rock Resort. The housing blocks are further punctuated by four geometric green spaces which add park space residents can expect to encounter at regular intervals. They are within the heart of the neighborhood. The open space system will have to rely on tree-lined streets and



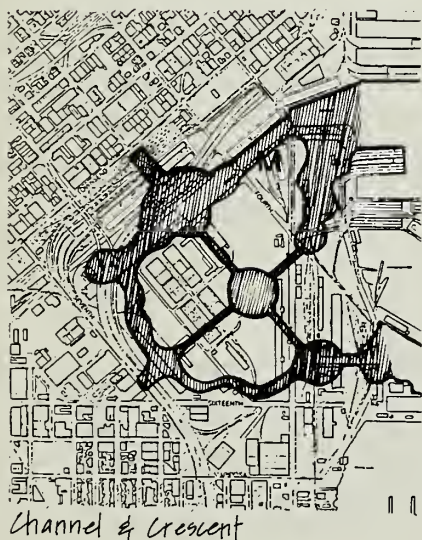
Channel & Spine

2.0 PLAN DETERMINANTS

wide sidewalks to create connections with Potrero Hill and additional connections to the Bay, Downtown and The Embarcadero.

The open space creates water and green space links to the Bay at both the north and south ends of the project. Also, the open space configuration and amenities are the main orienting features of the development. However, its centrality means that this open space amenity would be somewhat remote from housing at the edge of the Mission Bay neighborhood. It would produce one of the most efficient plan forms for maximizing the use of land for housing. Although similar to the pattern of square neighborhood parks found elsewhere in the City, the open space form is not reflective of Mission Bay historical patterns.

2.1.3 Channel and Bay Crescent

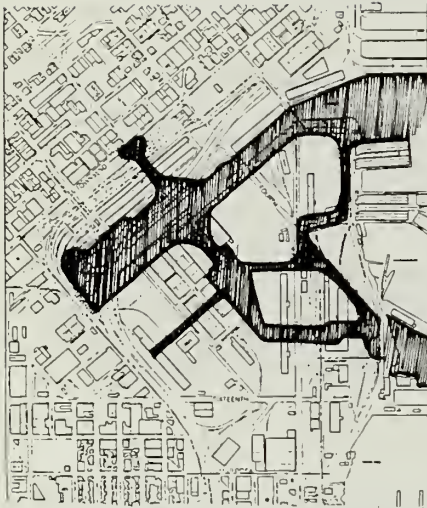


The strength of this concept is the shaping, orientation and equal distribution of open space throughout the site. This open space form responds to the configuration of the original Mission Bay. The open space form depicted by a canal system would connect the west end of the China Basin Channel with the Bay near the Mission Rock Resort. A central formal urban space linked to the crescent by a cross of pedestrian corridors could unite the development via one pedestrian network. A marsh habitat at the mouth of the channel could strongly connect with the through-site pedestrian corridors.

This open space pattern would provide a long linear edge for development frontage. Historic and present Bay patterns are strongly reflected in the scheme. The crescent extends close to Potrero Hill and Showplace Square and has the ability to accommodate a variety of building shapes and neighborhood connections. It therefore establishes a network within the development's neighborhood and ways of connecting to adjacent neighborhoods. The crescent shapes the Mission Bay neighborhood and has strong pedestrian connections and orientation to the Bay. Land use utilization may not be as high as in a more formal approach. Also, the crescent may be perceived as setting Mission Bay apart from the rest of San Francisco.

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2.1.4 Channel and Central Park



Channel & Park

This configuration would create a major open space amenity at the center and south of the existing China Basin Channel, and would take maximum advantages of the space created by the Channel. A pedestrian open space spine weaves its way from the Channel to its southern junction with the Bay near the Mission Rock Resort. This open space system would resolve the complex intersection of the South of Market and Third Street grids on the site. It also would acknowledge the need to retain Third and Sixth/Owens Street corridors. This central space would become the focus of views throughout the site. This spine could be dramatized by a central waterway, again linking the Channel with the Bay. Additional pedestrian ways stemming from the main central space could provide additional links to the waterfront and further integrate the system. This would provide a natural setting for the houseboat community.

This scheme could create a seam between two Mission Bay neighborhoods and make the most use of the Channel and central park as orienting elements. A unique San Francisco neighborhood could be developed around such a large informal open space. On the other hand, the central park takes a great amount of potentially developable housing area. Connections to Potrero Hill and adjacent neighborhoods must rely on boulevard (tree-lined) streets.

2.1.5 Channel Water Quality and Circulation

The existing China Basin Channel has serious problems with water quality. These are due to the discharge of raw sanitary sewage into the Channel during storms, and to the inherently poor circulation at the closed end of dead-end tidal sloughs. These problems can cause unpleasant odors and a very unattractive appearance to the water west of Fourth Street.

The channel system can be used to reduce the water quality problems by improving the circulation in the China Basin Channel. There are several possible channel configurations:

- o A dead-end channel. This corresponds to the existing channel configuration. It would have the disadvantage of

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having the same poor circulation and water quality problems as the present channel.

- o A main channel with a connection to the Bay near Mission Rock Resort. A new channel would connect the Bay near the Mission Rock Resort with the western end of the China Basin Channel. This would form a loop or central canal. The longer the loop or canal, the greater the potential for circulation patterns which could flush out the end of the China Basin Channel. If tidal action were allowed in this channel, a system of flap gates could be used to drive the circulation in the channel in one direction to obtain a net loop circulation. As an alternative, tidal action could be controlled and a pumping system could be used to keep Bay water moving in one direction through the loop. Advantages of this configuration would be improved circulation and an attractive open space element. Disadvantages would include the difficulty of routing the channel through existing utility and sewage structures, and possible problems with foundation conditions adjacent to the crescent channel. Adequate flow through the crescent channel to prevent buildup of sediment would be necessary. A new channel connecting the Channel near Fifth Street with the Bay near the Mission Rock Resort would have these same advantages and disadvantages except that there would be less capability for improving the circulation and poor water quality in the westerly end of the China Basin Channel.
- o A dead-end channel with an artificial pumping system. A pumping system would force Bay water through a pipe to the end of the China Basin Channel. Advantages would include improved water quality in the closed end of the channel and avoidance of construction difficulties with an extra channel. Disadvantages would include the absence of an attractive additional channel through the open space system.

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2.2 Street Grids

In the same way that open space systems provide functional and aesthetic purposes in a plan, a street system helps to organize and give character to that plan. A map of medieval, curvilinear roads presents a significantly different urban design solution than a grid of broad equidistant boulevards. The criteria for evaluating Mission Bay street systems stem from the Objectives and Policies and some fundamental land use planning principles. A street system should:

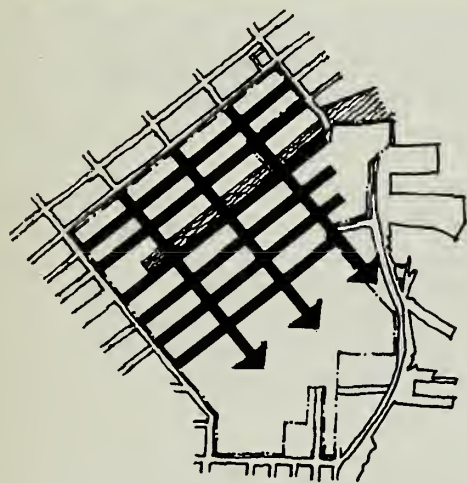
- o Define the scale and pattern of development;
- o Organize and connect various land uses; provide continuity with surrounding street systems;
- o Provide understandable links between project land uses, especially to and from public destinations;
- o Provide orientation for residents and visitors, especially for pedestrians, drivers of vehicles, and cyclists;
- o Provide visual corridor links with surrounding built or natural areas;
- o Functionally and efficiently link uses internal to the site and link the site with adjoining neighborhoods; and
- o Minimize hazards for travelers.

There is no complete street system on the site at present. It is anticipated that the South of Market grid would be retained north of the China Basin Channel. Similarly, it is assumed that Sixteenth Street and those streets on the site south of Sixteenth would be retained. The streets between the Channel and Sixteenth Street are the subject of this section.

2.2.1 South of Market Grid

This grid orientation would extend the South of Market street system below the China Basin Channel as far as Sixteenth Street. Thus, development on both sides of the Channel would

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South of Market Grid

have the same orientation. The existing Fourth and Sixth Street right-of-ways can be utilized, but Third Street south of the Channel is in conflict with the overall grid pattern because it has a north-south orientation that meets the South of Market grid at angles.

This grid would allow strong vehicular and visual corridor connections to the existing fabric to the north. It could provide street corridor views of Nob Hill, the Bay towards the Bay Bridge and the working drydocks to the south. Mission Bay south of the Channel would be linked directly and visually with major civic facilities (Moscone Center) in South of Market.

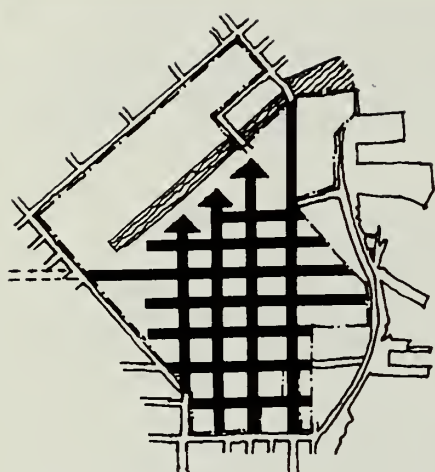
It would retain utility lines in Sixth and Owens Street, and would match the street pattern immediately to the west, where the South of Market grid continues to Sixteenth Street. The I-280 Freeway and Caltrain tracks prevent a connection, however. It could produce a large number of regular housing blocks which would help achieve the maximum number of housing units. The effect of the strong visual corridors into South of Market and the regular block pattern would be to produce an integrated San Francisco style neighborhood with multiple repeated block shapes rather than a development where many blocks are unique shapes or sizes.

On the other hand, this Third Street grid is not very compatible with the existing Third Street alignment. Third Street traffic would have to be moved east on Third or Fourth Street toward or onto China Basin Street south of the Channel. The Third Street right-of-way including several existing utility lines would have to be abandoned between Fourth and Sixteenth Streets. There could be hazardous intersections creating traffic operations problems along Third Street where streets meet at non-perpendicular angles. This grid does not facilitate connections with Showplace Square and limits Bay views along streets to the southeast views.

2.2.2 Third Street Grid

This grid is parallel to Sixteenth, Mariposa and Third Streets and has the same north-south, east-west orientation as streets on nearby Potrero Hill. The presence of these two streets

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3rd Street Grid

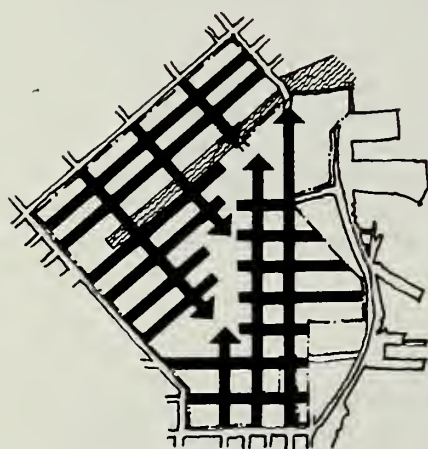
form the basis for implementing this grid in Mission Bay. Both streets serve as entryways to the site. The Channel, Seventh, Sixth, and Fourth Streets would be at an approximately 45 degree angle to this grid.

This grid reinforces connection to the street grid south of Sixteenth Street. It also would provide opportunities for direct vehicular and/or visual corridor connections to the south, to Showplace Square along an extension of Division Street. Third Street could continue to serve as the main arterial through the project area without modification. This grid orientation also would provide street corridor views of the Bay Bridge, Downtown and east to the Bay.

The grid would produce odd configurations next to the Channel, and along the western site boundary, resulting in irregular blocks. This is both an opportunity and a problem. Also, where this grid intersects Sixth or Owens Streets, irregular, potentially hazardous intersections would be created.

Although this grid is oriented the same way as the Potrero Hill grid system, the Potrero Hill Streets do not reach the site. Few Mission Bay visual corridors would extend into surrounding areas.

2.2.3 Mixed Grids



Mixed Grids

This concept plan would utilize a meeting of the South of Market and Third Street grids somewhere on the site. Wherever the two grids meet, that intersection must be resolved. Complex, fragmented, or odd-shaped blocks are created by the two grids where they meet but there are opportunities to minimize this through the use of open space or curvilinear streets.

Use of the mixed grids would permit Third Street to continue through the project along its current alignment and would provide a great variety of different open spaces at their central juncture.

Numerous dead-end and inefficient streets would be created by a mixed grid with central open space. Such cul-de-sacs could

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offer quieter residential streets with reduced traffic volumes. The neighborhood created within the project would be divided into even smaller areas by the open spaces between the two street grids. High land use efficiency would be difficult to achieve on the odd-shaped parcels at the juncture of grids. The reiterated block pattern of a traditional San Francisco neighborhood cannot be achieved using mixed grids.

Views to the Bay from the interior and western areas of the site would be blocked by building masses reflecting the changes in direction of the streets. View corridors along streets are abbreviated by the central changes in the grid and would focus on open space internal to the site.

2.3 North of Channel Arterials

There are three roughly east-west City streets which serve the Mission Bay site north of the China Basin Channel: Townsend, King and Berry. These three parallel streets divide the area between Townsend Street and the Channel into three blocks each approximately 250 deep. The typical South of Market block is about 550 feet deep between major streets. The North Channel Arterials not only serve this site but are also important as links in the South of Market street system which could connect the waterfront with the Showplace Square area and the I-280 freeway. Similarly, these streets may become routes for future Muni Metro and Caltrain lines although the Metro and Caltrain implementation schedules vary. The Metro is likely to be developed before any Caltrain undergrounding options are realized.

2.3.1 Townsend Street

Townsend Street is on the north edge of the site and runs from The Embarcadero to the center of the Showplace Square area. The right-of-way on Townsend is about 82 feet. Alternatives for the ultimate function of Townsend are described below.

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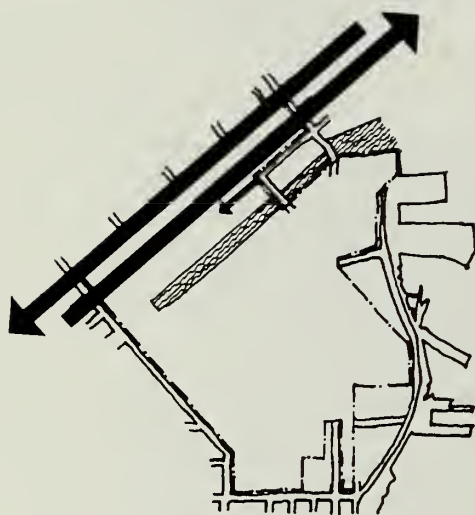
2.3.1.1 Local Service Two-Way Street With or Without a Major Transit Function

A two-way street on Townsend would complement a boulevard operation with Muni Metro on King Street. The Muni Metro could be routed in the center of a two-way Townsend with a major transfer to the Peninsula Commute service provided at an underground Caltrain Station. However, Muni Metro service would not be routed on Townsend if the Caltrain service were not located on Townsend.

A disadvantage of attempting to route any major transportation service on Townsend is that it requires reconsideration of the plans for the South Beach project which currently show limited through traffic on Townsend to The Embarcadero. The Muni Metro would generally be considered to have less of an impact than a major arterial and therefore may be more compatible with the present South Beach plan. It would likely require a side-running Muni Metro (see 2.6.2.1) on The Embarcadero, not a median strip as presently contemplated in the South Beach Plan.

2.3.1.2 Through Traffic One-Way Street With or Without a Major Transit Function

Townsend could be designed to serve as part of the one-way South of Market street system to the north and would serve the project as part of a one-way couplet with a one-way King Street. Townsend would serve traffic destined for the project as well as serving trips between the waterfront and the I-280 freeway and Showplace Square. A one-way couplet would have clear traffic operations advantages, such as the ease of synchronizing traffic signals and reduced turning movement conflicts at intersections. However, this type of operation on Townsend would conflict with the current plans for the South Beach project. The overall traffic service advantage for the entire area from South Beach to Showplace Square provided by the one-way operation may, however, offset the benefits of limiting traffic on Townsend as currently proposed in the South Beach plan. Also, while a one-way couplet carries traffic better than a boulevard, it requires two streets to bear heavy traffic volumes.



One-Way Couplet

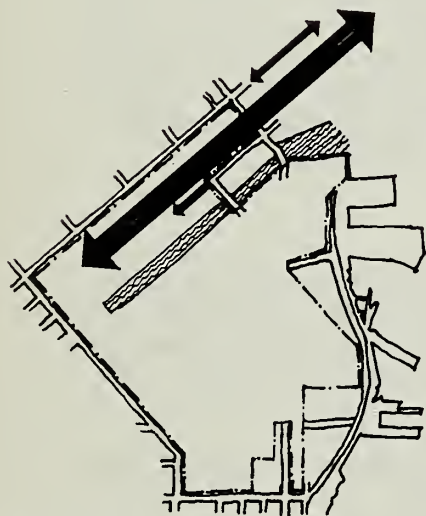
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The Muni Metro could be located on a one-way Townsend, on the side of the street. Locating the Metro on a one-way Townsend would probably require a widening of the existing right-of-way by 30 to 50 feet.

2.3.2 King Street

King Street is a partially developed right-of-way running from The Embarcadero to the intersection of Division and DeHaro Streets. The King Street right-of-way is approximately 75 feet wide. The ultimate uses of King Street are indicated below.

2.3.2.1 Through Traffic Two-way Boulevard With or Without a Major Transit Function



Boulevard

The current City policy for the development of King Street as shown in the recently completed I-280 Transfer Concept Report is for a two-way boulevard connecting with The Embarcadero Boulevard and including the Muni Metro extension to the Caltrain Station at Fourth and Townsend Streets. The right-of-way for this boulevard would have to be between 150 feet and 160 feet wide in order to incorporate all required street, transit, pedestrian activities and landscaping.

The I-280 plan shows the boulevard serving new freeway ramps and then turning south across the Channel but not connecting to the areas west of Mission Bay, such as Showplace Square. In order to fully develop the street system in this area of the City, all major arterials need to be integrated into the existing City grid and King Street, as a major thoroughfare, should be designed to serve the entire area between the waterfront and Showplace Square.

If the Caltrain Station is not located adjacent to or under King Street, the Muni Metro need not be routed on this boulevard. It could serve the new development almost as well and could serve existing South of Market areas better if routed on Townsend Street. The width of the boulevard could be reduced by about 44 feet or more landscaping could be provided here by locating the Muni Metro service elsewhere.

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2.3.2.2 Through Traffic One-Way Street With or Without a Major Transit Function

The alternative to the boulevard is a one-way street which would require less right-of-way, could be more fully landscaped and could provide for more efficient traffic movement. King Street could be coupled with Townsend as discussed above, or with Berry Street should that right-of-way be developed as a through street. A disadvantage of a one-way street is the fact that its image is one of swift traffic movement while a boulevard, if adequately designed and landscaped, may suggest more of a sense of place for vehicles and pedestrians.

If the Caltrain Station were located near to or under King Street, the Muni Metro should also be located near this right-of-way to assure convenient transfers. If Muni Metro were located on a one-way King Street it would have to be side-running and would suffer from the disadvantages of limiting access to building frontages and causing difficult turning movements for automobiles at intersections.

2.3.3 Berry Street

Berry Street is a partially developed right-of-way south of King running from The Embarcadero to De Haro Street. The Berry Street right-of-way is about 82 feet wide. A sewer box culvert 17.5 feet square is located under Berry Street. The ultimate uses for Berry Street are:

2.3.3.1 Through Traffic One-Way Street With or Without a Major Transit Function

Berry Street could be coupled with King Street to form a one-way street system across the north side of the Channel. The South Beach Plan has included such a one-way couplet connecting to The Embarcadero Boulevard at Second Street. The Muni Metro could be routed on a one-way Berry Street. It would be side-running and would be some distance from the potential locations for the Caltrain Station (see Section 2.6.1) and from the South of Market area.

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Berry Street is not as good a route for through traffic between the waterfront and Showplace Square as are King and Townsend because it does not easily connect with the Showplace street system. Because Berry is close to the Channel crossings, its intersection with Third and Fourth Streets could be easily congested if it were planned as a major traffic carrier.

Also, developing Berry Street as a through route along with Townsend and King Streets, would divide the area north of the Channel into three relatively narrow blocks and somewhat curtail the development and amenity potential of this area. Development of Berry also would preclude planning of major open space and development on the North side of the Channel.

2.3.3.2 Local Access Street With No Through Transit Function

The Berry Street right-of-way could be used as an access route to the developments facing the Channel and not be connected between major streets. There would be no major transit routes on the right-of-way but local service could be provided if needed to supplement the main corridor transit service on King or Townsend Streets. Portions of the right-of-way could be developed or used for open space. Used in this fashion, the Berry Street right-of-way could provide flexibility in building layout and improve the opportunity for large open space.

2.4 West Side Arterials

The west side of the site is cut off from the adjacent City street system by the mainline/Caltrain railroad tracks and by the I-280 freeway and its ramp structures. While Seventh Street forms the western edge of the project, it does not serve the site except in the area near its intersection with Townsend and King Streets. The project needs a west side, roughly north-south thoroughfare not cut off by the railroad and the freeway to alleviate traffic loads on Third Street.

Because Seventh Street does not directly serve the project site, the only available streets which link the areas north and south of the Channel are Third and Fourth Streets which are limited in capacity by the existing bridges. The west side

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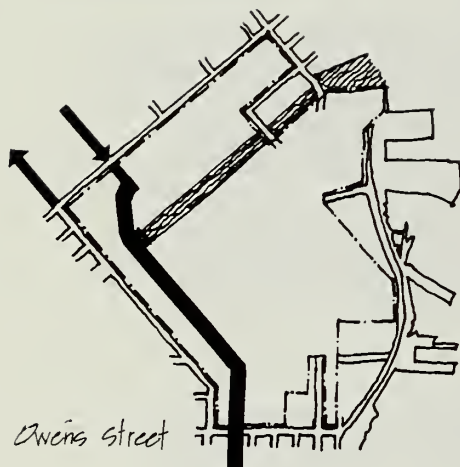
arterial would provide an additional Channel crossing for both automobiles and public transit vehicles (see Section 2.6.2.4).

South of the Channel there are two possible rights-of-way available for the west side arterial, on either Owens or Sixth Streets. North of the Channel the extension of Sixth Street is the only logical route available.

This would necessitate removing the navigable waterways designation for the western-most end of the Channel. Such a process involves coordination with and concurrence by several other public agencies. It would also impact the western end of the Mission Creek Harbor Association.

2.4.1 Owens Street

Owens Street is about a 75 feet wide partially developed City street right-of-way running from about Channel to Sixteenth Streets. The right-of-way is located parallel to and approximately midway between Sixth and Seventh Streets. There is a 66-inch force main located under Owens Street.

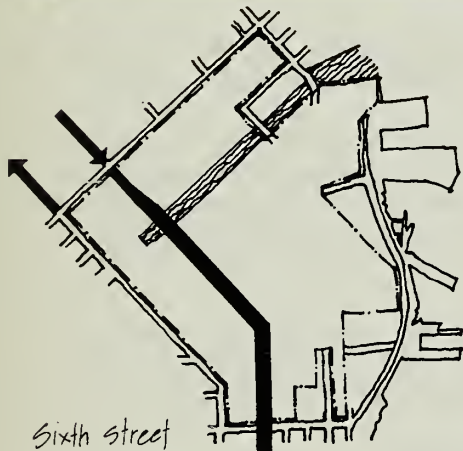


The advantages of Owens Street as the west side arterial would be that (a) it is the furthest west of the available rights-of-way so that a new crossing of the China Basin Channel would have a lower impact on the waterway navigability status and upon the Harbor Association; (b) it is also closest to a possible location for the Caltrain Station at Seventh and Channel Streets so that transit service could be easily routed to serve the Station; (c) it is closest to the freeway so that the busier and noisier local thoroughfare would be located near the freeway noise, leaving the areas east of Owens available for local street and residential development.

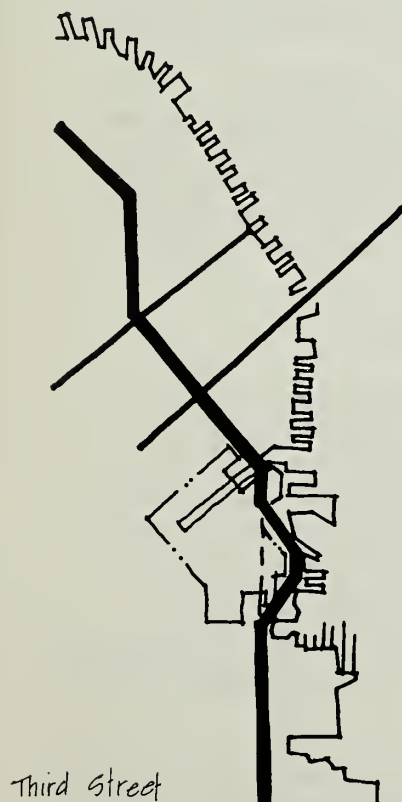
2.4.2 Sixth Street

Sixth Street is an 82 feet wide right-of-way developed as a City street south of the Channel and north of Brannan Street. There is a 30-inch by 48-inch by 2,000-foot sewer box located under Sixth Street south of the Channel. The existing ramps from the I-280 freeway touch down at Sixth and Brannan Streets and block the extension of Sixth into the project site.

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South of the Channel the use of Sixth Street as the west side arterial could provide for local shopping for residential development on both sides of the main street. Through traffic on Sixth could adversely impact nearby residences. If the Caltrain Station is not relocated, the southerly extension of the Muni Metro service could be via Sixth Street and would be closer to the interior of the project than if the Muni Metro were located on Owens Street. It should be noted here that most residents prefer living one block from a transit street rather than on that street. If the Station moves to Seventh and Channel Streets the Muni Metro would have to be routed to that location and would not be able to easily use the Sixth Street alignment.



North of the Channel either the Owens or Sixth Street arterial would have to transition to a Sixth Street alignment in the vicinity of King Street. The extension of Sixth Street north from the project to meet the existing Sixth Street at Brannan Street is important in order to permit the most efficient operation of the South of Market street system. This connection would require removal of one or both freeway ramps at Sixth and Brannan Streets. Sixth Street is tentatively planned to become one-way southbound and will work with the northbound Seventh Street to connect the northwest corner of the project with the Civic Center and the westerly portions of the South of Market. If Sixth Street is not connected from the project site to the South of Market grid, Mission Bay-destined traffic will be diverted to Fourth Street and cause additional congestion problems at the Fourth Street Bridge and within the project street system.

2.5 East Side Arterials

The east side of the site is currently served by Third and Fourth Streets, which are limited in their capacity by the existing bridges across China Basin Channel. Truck and automobile traffic currently use the two streets for Port of San Francisco activities and to go north or south through the site. The two streets carry traffic to Market Street and beyond to the north and Third Street extends through the Bayview neighborhood to the south. Third Street follows the

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historic Long Bridge Route which spanned the mouth of Mission Bay. (Note: Add Third and Fourth Street width and utilities.)

It should be noted that Third Street presently serves as a major at-grade traffic route for ___ miles along the eastern edge of the San Francisco peninsula. If Third Street is rerouted, care would need to be taken to ensure the continuous flow that is presently provided.

South of China Basin Channel there are two possible routes that Third and Fourth Streets can take. North of the Channel these streets will essentially remain as they exist today.

2.5.1 Existing Third and Fourth Streets

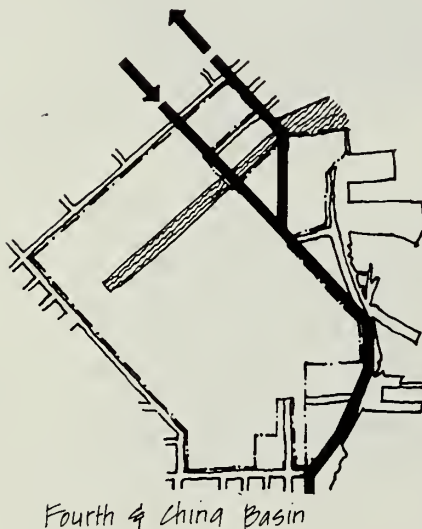
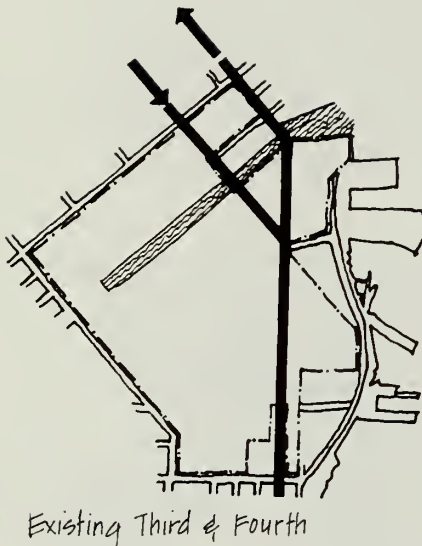
The routes for Third and Fourth Streets could be maintained as they now exist, both to the north and the south of the Channel.

This alternative is the least expensive and provides a direct path for traffic to travel. This existing alignment provides travelers from neighborhoods south of the site with direct visual as well as vehicular access to South of Market and Downtown. However, as an arterial, Third Street south of the Channel will be potentially disruptive to a Mission Bay residential neighborhood nearby.

2.5.2 Fourth and China Basin Streets

South of Channel and below the intersection of Third and Fourth Streets, Third Street could be vacated south to Sixteenth Street. Fourth Street would be extended until it intersects China Basin Street and China Basin would become the major east side arterial until it again intersects the Third Street right-of-way immediately south of Mariposa Street. Third Street would follow its existing alignment until it reaches Fourth Street. Alternatively, Third Street could continue southeast directly in line with the Third Street Bridge to intersect China Basin Street, then loop south around Mission Bay.

These changes to Third Street would allow the arterial to least affect the new Mission Bay residential neighborhood. The new



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route goes around the neighborhood, not through it. The change to Third Street requires relocation of utilities which are presently in the Third Street right-of-way. The traffic flow along the new route will not significantly change and the historical function of Third as a north-south link within the city can be preserved, albeit a little more indirectly.

A disadvantage of this route is that redirecting major traffic flows to the Bay's edge diminishes future opportunities to provide public access and amenity there.

2.6 Rail Transportation

Rail transportation systems are some of the most important determinants for the Mission Bay Plan. There are two public transit systems to be considered: The Peninsula Commuter Rail Service (Caltrain) and the Municipal Railway Surface Rail Systems (Muni Metro Light Rail Service and the "E" Line Streetcar). There is also freight rail service which must be maintained between the Mainline and the waterfront via the Belt Railway north of the Channel and to the Central Waterfront area south of the Channel.

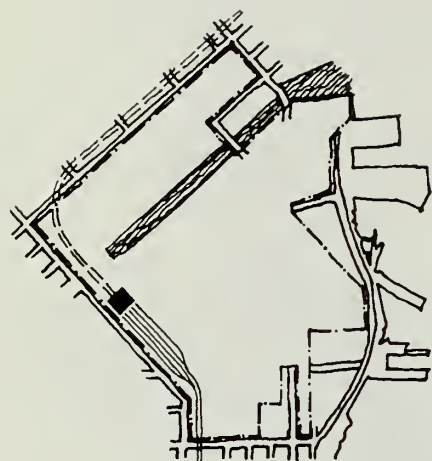
2.6.1 Peninsula Commuter Rail Service (Caltrain)

The most important issue for the Commuter Rail Service is where the San Francisco terminal should be located. The public agency currently responsible for the operation of the service, the California Department of Transportation (Caltrans), would like to extend the service to a downtown underground location but a financial program to accomplish this work has not yet been developed. The current location of the terminal at Fourth and Townsend Streets requires several City blocks for its station and trackage. The existing surface trackage areas block the extension and connection of several sections of the street grid system between Townsend and King Streets, are a somewhat blighting influence on neighboring areas and impair the orderly development of this part of the Mission Bay site. Several new locations for the Commuter Rail

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Station have been suggested as a first phase of the aforementioned project to extend the service to downtown.

2.6.1.1 Under the Existing Freeway Structure at Seventh and Channel Streets



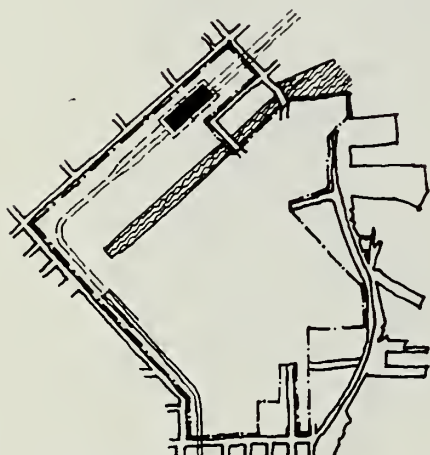
Seventh & Channel station

A right-of-way north from this site would be provided through the project to Townsend Street which could accommodate the possible future extension of the Commuter Rail Service. This site would make use of the otherwise unusable area under the freeway structure in order to develop a 6 track surface terminal station. Muni Metro, "E" Line and other surface transit would be routed to the station in order to provide a convenient transfer for commuters.

This location would be the least expensive of the alternatives being considered. It could be developed quickly and it has the potential to better serve the area west of Seventh Street. Lastly, it does not consume valuable north-of-Channel real estate.

On the other hand, it is over a half mile farther from downtown, the ultimate destination of most commuters, than is the current location. It is also farther from likely Mission Bay office areas north of the Channel. Also, it will require routing the Muni Metro to the western edge of the project in order to serve commuters and thus reduce service to the project itself.

2.6.1.2 Under Townsend or King Street at Fourth Street



Station at Fourth

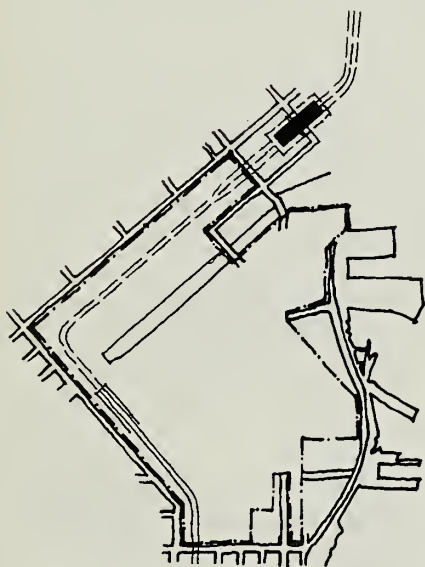
This station would be developed as an underground way station rather than as a terminal and would include sufficient tail tracks to reverse trains at this location. Future extension would be possible by continuing the subway to a downtown terminal.

The advantages of this location are that existing commuters would not have to adjust their commute to a station further removed from their ultimate destinations. If the Muni Metro were routed on the same street as the Commuter Service a direct escalator connection could be provided for the transfer between the services. Also, the Muni Metro would not have to

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be routed to the western edge of the development south of the Channel and could provide better service for Mission Bay.

However, the costs of building an underground station and subway would be higher than for a surface station. The costs for construction and the amount of disruption to existing development would be less on King than on Townsend Street. However, the timing on the commitment of public funds for this project is not clear. The excavation and construction of a King Street station and associated trackage could occur after King Street is developed as a major street in the first phase of Mission Bay and thus disrupt both Muni Metro service and the Mission Bay development process.



Station at Second

2.6.1.3 Under Townsend or King at Second Street

This location has similar characteristics as described above for the underground station at Fourth Street but is about 2,000 feet closer to the job concentrations planned for the eastern portion of the South of Market. The main advantage for this location is it will be within walking distance for the most jobs of any of the sites considered.

This location will not serve the job center of the Mission Bay development as well as the Fourth Street location. It will require an area for tail tracks which extends well into the South Beach project along The Embarcadero and would require commitment of construction funds in the immediate future in order to be fully coordinated with that project.

2.6.1.4 Under the Freeway at Seventh and Sixteenth Streets

The operation of a station at this location would be similar to that described above a terminal at Seventh and Channel Streets. The station would provide six tracks on grade with a station house. A right-of-way north from this site would be provided through the project to Townsend Street which could accommodate the possible future extension in subway of the Commuter Rail Service to downtown.

Advantages of this location is that it would permit removal of all tracks north of Sixteenth Street, eliminate the grade-

(need graphic)

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crossing at Sixteenth Street, the last such crossing on the mainline in San Francisco, and allow extension of several streets into the project which cannot be connected as long as the tracks exist under the freeway. A much improved connection between the project and Showplace Square and Potrero Hill area could be provided in Hooper, Iwin, Hubbell and Dagget Streets could be extended into the project. The Muni Metro could be routed to serve Mission Bay north of the station and then be routed to the commuter terminal thus providing a convenient transfer for commuters to downtown.

Disadvantages of this site are that it is furthest removed of all those being considered from the job concentrations in the South of Market area and at Mission Bay and would have the greatest negative impact on the Commuter Rail Service. The cost of developing this location could be high as it may require a reconstruction of the north end of mainline Tunnel No. 1 in order to provide the space required by a six-track fan approaching the station. The Muni Metro crossing of Sixteenth Street would require a high volume operation and limit the traffic capacity of the street near the station.

2.6.2 Muni Metro/E Line Streetcar

Current City policy is to extend the Muni Metro service from Market Street along The Embarcadero to the Caltrain Station at Fourth and Townsend Streets. The City also plans to develop a streetcar line from the Fisherman's Wharf area along The Embarcadero to join with the Muni Metro tracks south of the Ferry Building and to also serve the Caltrain Station. If the Caltrain Station is relocated, the Muni Metro and E Line should be extended to provide the Peninsula Commuters with a convenient transfer to Muni service. The location of the Muni Metro and E Line routes is, therefore, linked to the decision on the location of the Caltrain Station. Options for the Muni Metro and E Line are:

2.6.2.1 Center- versus Side-Running

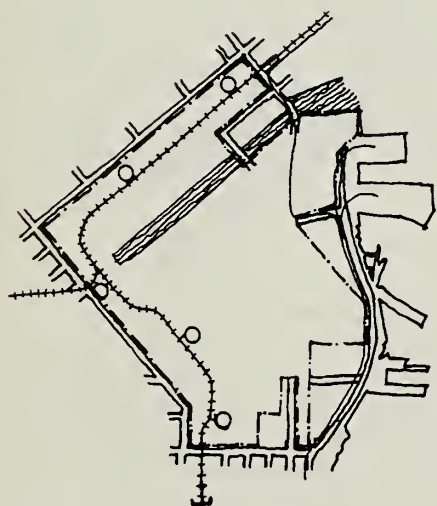
A center-running route avoids conflict with vehicle access to street frontage, is less complicated to deal with at street

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intersections, and can be more easily separated from non-vehicle traffic between stations.

Side-running is constrained by each of the features listed above as an advantage for center-running. Side-running may, however, be more easily separated from vehicular and pedestrian traffic which could therefore be a substantial operating advantage for a high-speed Muni Metro style of services. Side-running can have a service advantage where most users approach the route from only one side of the street. This situation occurs along The Embarcadero because most users come from locations inland from the Bay. Combined with landscaping, it can provide buffering between neighboring development and a heavily-trafficked roadway, as transit vehicles pass much less frequently. Side-running is almost always used on one-way streets.



Route Option to South

2.6.2.2 Townsend Street

The Muni Metro and E Line should be located on Townsend Street if the Caltrain Station is constructed under the street. As noted earlier, the Muni Metro may be developed before Caltrain undergrounding is realized. Surface rail would be in the center of a local access two-way Townsend or on the south side of a through traffic one-way street. The use of Townsend is constrained by the current plans for the South Beach Project and will have to be coordinated with that work before a firm plan for the use of the street can be developed.

2.6.2.3 King Street

Current City plans call for the Muni Metro and E Line to be located along King Street. If the Caltrain Station is relocated under King the surface rail will have direct transfer capability. The same phasing issue arises as for Townsend, as Muni Metro would likely precede Caltrain undergrounding. If Caltrain is relocated under Townsend and the surface rail transit is located on King it would be necessary to provide a convenient connection between the streets and the transfer between transit services would require a short walk.

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Surface rail would run in the center of a two-way boulevard or would be on the north side of a one-way King Street. As discussed above, the right-of-way required for a two-way boulevard including pedestrian, vehicle and surface rail transit functions would be from 140 feet to 180 feet. A disadvantage of having all these functions on a single two-way street is the large right-of-way requirement.

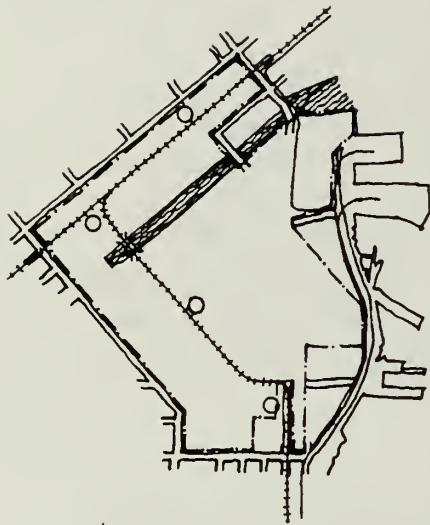
2.6.2.4 Channel Crossing

The surface rail transit could theoretically be brought across the Channel on either of the existing Third or Fourth Street bridges or on a new crossing. With the full development of Mission Bay the capacity of the existing bridges will be taxed heavily. Expected vehicle congestion would interfere with the efficient operation of any surface transit system which was sharing use of those bridges. Because the Muni Metro would be designed as a relatively high speed service which requires an almost exclusive right-of-way, the shared use of the existing bridges would not be appropriate for a Muni Metro route. The Muni Metro should cross the Channel on a new bridge in either the Owens or Sixth Street alignments.

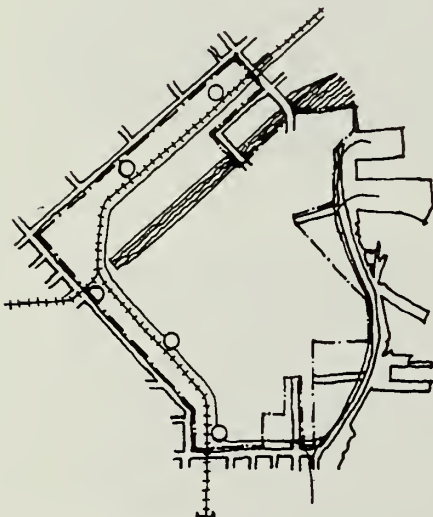
2.6.2.5 Routes South of the Channel

South of the Channel the Muni Metro and the E Line will have to serve the Caltrain Station if it is relocated at Seventh and Channel. The Muni Metro would travel south from the Station on or adjacent to Owens Street to provide service to Sixteenth Street with further southerly extensions to be provided as required by City policy. The E Line could be extended west from the Station on the Division Street right-of-way into Showplace Square, with a possible connection up Eleventh Street to Market Street at Van Ness Avenue. This would complete a surface rail transit loop around the South of Market area.

If the Caltrain Station is not located at Seventh and Channel, the Muni Metro could run south on Sixth Street to Sixteenth with possible additional southerly extensions. The E Line would not cross the Channel at all. North of the Channel the E Line could be extended directly to Showplace Square along



Channel Crossing



King Transit Corridor

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either King or Townsend Streets and then complete the potential loop of the South of Market area as described above.

2.6.3 Rail Freight Service

Rail freight service to the Port of San Francisco must be maintained both north and south of the Channel. North of the Channel the Belt Line serves the piers of the Northeast Waterfront. South of the Channel it will be necessary to provide a rail connection between the Central Waterfront and the Mainline.

2.6.3.1 Belt Line Service

The Belt Line currently serves the waterfront north of the Channel and connects to the mainline on King Street. There are two alternatives to continuing the mainline connection to the Belt Line. A route through or around the northwest corner of the project to meet the mainline under the freeway near Seventh and Channel would parallel the existing route and could be a surface equivalent to the underground Commuter Rail Service. A disadvantage of this route is that it would require space in either Townsend or King Streets where right-of-way requirements are large even without the Belt Line, and it would introduce freight rail traffic on the reconstructed street system.

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graphics -*

Alternatively, the Belt Line could be situated within traffic lanes, with its use restricted to night hours when traffic conflicts are reduced and this pattern might continue. A second route would use the existing track on the Third Street Bridge and reconstruct the trackage south of the Bridge to connect with existing tracks in Illinois or China Basin Streets. Re-alignment of the track north of this Bridge may also be required to replace an existing short radius curve. This route would be least disruptive to the project but could require a greater investment in new trackage.

2.6.3.2 Central Waterfront Connection to Mainline

Piers 48 to 64 are currently connected to the rail mainline by trackage which proceeds easterly across the project site from

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the north end of Tunnel No. 1 in the vicinity of Sixteenth Street. This connection or one of equal capacity will need to be maintained until an alternative rail route is provided. Such an alternative would be available when the Port of San Francisco completes its plan to build a rail bridge across Islais Creek, as part of its current Container Terminal Modernization Program, which will permit rail access to these piers from the south up Illinois Street. There are other possibilities to connect the mainline with Illinois Street are currently under investigation.

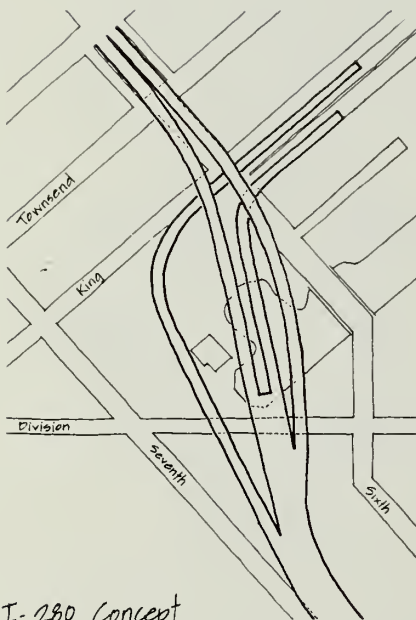
2.7 I-280 Freeway Ramps

The existing terminus of the I-280 Freeway will be revised to meet the needs of both the Mission Bay project and of the I-280 Transfer Concept Program recently adopted by the Board of Supervisors. The I-280 Program proposes removing the existing freeway structure between Third and Sixth Streets and constructing new ramps to serve the east-west traffic across the north side of the project to and from The Embarcadero. The existing north-south ramps which touch down at Sixth and Brannan Streets would be maintained in the current I-280 Program. Several alternative ramp configurations including the ramp system proposed in the I-280 Program are described below. These initial concepts will require further investigation.

2.7.1 I-280 Transfer Concept Program Ramp System

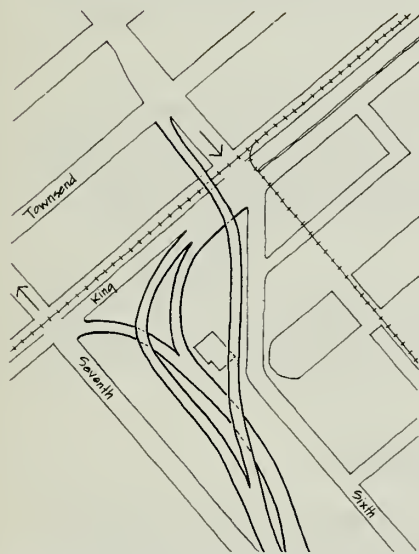
Existing north-south ramps to Sixth and Brannan Streets would be maintained and new east-west ramps oriented toward The Embarcadero and King Street would be constructed. The new ramps would touch down on King between Fifth and Sixth Streets.

With this solution, the existing heavily congested intersection at the ramp touch down at Sixth and Brannan Streets is maintained; the extension of Sixth Street south of Brannan Street would be blocked by the ramp touch down; the extension of Sixth Street across King Street would be blocked by the new ramp system; the interchange would not relate to the South of Market one-way street system where Sixth would be one-way

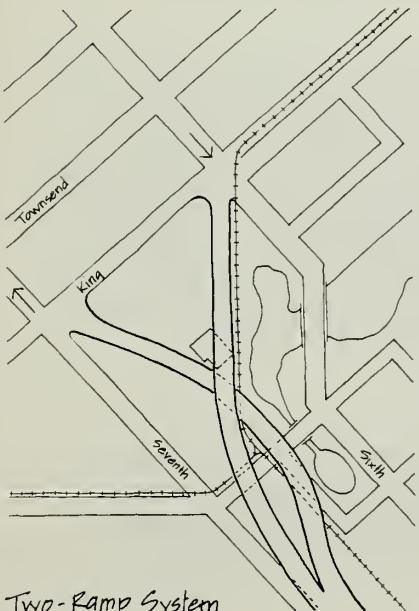


I-280 Concept

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Revised Four-Ramp System



Two-Ramp System

south and Seventh one-way north forming a couplet north to the Civic Center; and the connection of the Showplace Square area to the I-280 freeway would be indirect.

This ramp system would not require any expense to modify the Sixth and Brannan ramps, and it would direct incoming traffic across the north side of the project toward The Embarcadero. It would be sufficiently high to permit Division Street to be extended into the site.

2.7.2 Revised Four Ramp System

The I-280 Transfer Concept Program ramp system can be improved by moving the touch down for the northbound off-ramp from Sixth and Brannan to Seventh and King and by moving the touch down for the east-west ramps west of Sixth Street. With these revisions it would be possible to connect most of the South of Market grid to the Mission Bay site and better serve those areas north and west of the site. The elimination of several turning movements would improve the efficiency of the Sixth and Brannan intersection. Sixth Street could be routed as southbound one-way street from Brannan across King and south across the Channel.

However, the revised four ramp system would require the removal of the northbound off-ramp structure and the construction of a new northbound off-ramp which would increase the costs over the I-280 Program proposed amount.

2.7.3 Two-Ramp System

A system which minimizes the area required for freeway ramps would be possible if a one-way street pattern is developed on the north side of the site. This system would require the most extensive teardown of the freeway and the complete removal of the existing ramps to Sixth and Brannan. Traffic volumes from northeast San Francisco would move down The Embarcadero to King and feed onto I-280 along east-west streets in the north of the Channel area. New ramps would be constructed bringing freeway traffic into two street intersections. The northbound off-ramp would touch down at Seventh and King Streets and the southbound on-ramp would

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start at Sixth and King Streets. By operating as a one-way street system the intersections would have to serve only two major directions of traffic flow and would be more capable to deal with the freeway traffic loads.

The reduced ramp system would result in greater surface street traffic loads and possible levels of congestion for traffic trying to reach the freeway but would also provide the greatest relief from the intrusion of the freeway structure in the northwest corner of the site.

The cost of tearing down additional freeway structure would be higher in this system than in the other two discussed above but the new ramp construction could be less expensive than for the other two alternatives.

2.8 Port Activities East of Third Street

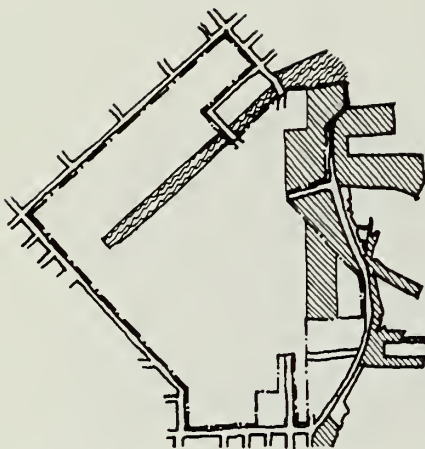
There are three possible futures for the port activity east of Third Street. Operations could continue as they presently do, be expanded, and/or be relocated. Each of these would have effects on Mission Bay as a residential neighborhood.

2.8.1 Present Activity Level

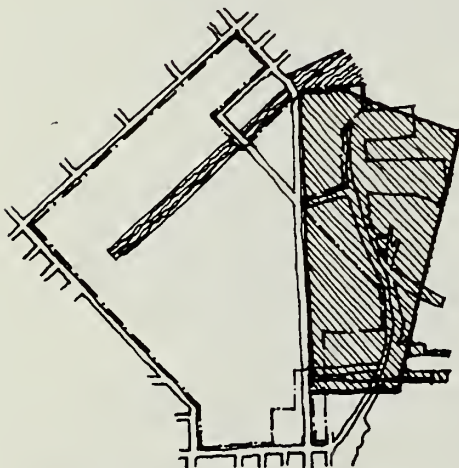
If the port activity stays about the same, it will not adversely impact the development potential of Mission Bay. Then the Mission Bay project could be planned as a San Francisco neighborhood. There would continue to be significant port and commercial traffic on Third Street. If that truck traffic were moved further east toward China Basin Street, residential values in that corridor could be enhanced. On the other hand, future public recreation and access to that waterfront would be constrained by a roadway near the water's edge.

2.8.2 Expanded Containerization

An expanded port with the container terminal called for the Port's Master Plan would use all the land adjacent to and including the site east of Third Street. Because of traffic, noise, lights and other port activity, the parcels along the



Present Port Uses



New Container Terminal Uses

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western frontage of Third Street would be unsuitable for housing.

2.8.3 Relocated Maritime Activity

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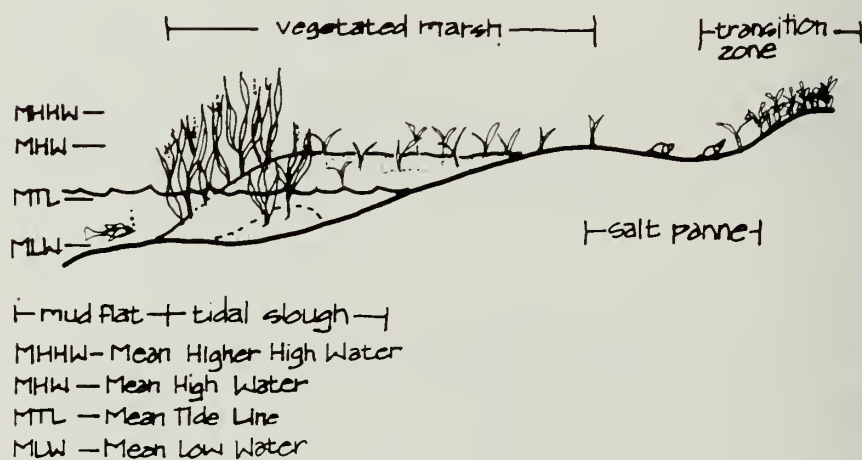
A reduction of port activity in the Mission Bay area along with shifting container terminal expansion to the waterfront south of the site would enhance the potential for waterfront residential and commercial activity along the shoreline. It would provide for a possible stronger pedestrian connection from housing to the waterfront and allow new land use organization, circulation, and parks and recreation areas. It would also have maritime advantages because all container facilities would be concentrated in one location, facilitating rail access.

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2.9 Wetlands

2.9.1 General Requirements

Wetlands may consist of marshes, mudflats, ponds, channels, and subtidal habitats. A typical tidal marsh is distinguished as a band of vegetation spreading between the unflooded upland and the continually submerged water basin. Within the band of vegetation can be found a mosaic of tidal channels; open, non-vegetated areas (either mudflats or pannes); shallow ponds; and low islands or levees which are flooded only on extreme tides (Figure 1).



Wetlands Habitat

Given the high cost of land throughout the Bay Area and the need to support a broad spectrum of wildlife needs, wetland managers have sought to create diverse habitats within close proximity. No one can afford the luxury of broad, expansive

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pickleweed marshes, for example, as existed historically. Instead, wetland restoration sites include buffers from adjacent development, creation of islands for protected upland habitat during high tides, and a network of shallow ponds, channels, and mudflats to support both feeding and nesting requirements of the resident and migratory birds. Thus, the characteristics that one normally associates with the historic and few remaining natural marshes of San Francisco Bay need to be modified so that a diverse set of habitats can be included within smaller areas.

2.9.2 Types of Wetland Possible at Mission Bay

Under the present conditions of drainage, storm water discharge, and tidal flows, saline marshes are the only type which could exist on or near the site. Salinities at this location in the San Francisco Bay system are usually between 25 and 33 ppt (normal seawater is 35 ppt and freshwater is 0 ppt). Freshwater discharge is limited to winter months only, and no major streams which might prolong freshwater flows enter the Bay at this location. Brackish water marshes require reduced salinities of between 1 to 10 ppt to occur for long periods of time during the growing season (up to 6 to 9 months). Given the large tidal prism in the China Basin and the small size of the residual tidal volume, freshwater inflows are quickly flushed within a matter of several tidal cycles. As a result, salinities within the China Basin are similar to those in the adjacent bay.

¹ More detailed description of the characteristics of San Francisco Bay tidal marshes is given in Appendix A. The reader is also referred to: The Ecology of San Francisco Bay Tidal Marshes: A Community Profile prepared for the US Fish and Wildlife Service/Office of Biological Services, National Coastal Ecosystem Team, Slidell, LA.

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2.9.3 Advantages and Disadvantages of Locating a Wetland Habitat at the Mission Bay Project Site

The primary biological goal of locating a wetland at China Basin would be the creation of a more diverse habitat than presently exists. This would provide an area that could be utilized by the wildlife found along San Francisco's eastern shoreline during all stages of the tide. The protected nature of the China Basin would be supportive of vegetated marshes and the provision of roosting and nesting areas for birds during storms and high tide events.

Additional wetlands proposals on the eastern shoreline include Candlestick Point National Recreation Area and Pier 98. The Candlestick Point General Development Plan calls for enhancing present wetlands areas within a 32-acre parcel north of the Yosemite Canal. Presently, there are extensive mudflats, and the plan proposes creating a nature trail, boardwalk, and bird island. This area faces toward the southeast and is very exposed during major winter storms which are usually accompanied by strong southeast winds. The south side of Pier 98 includes a marsh and tidal mudflat area. The Port proposes to develop public observation areas to overlook this marsh.

An expanse of wetland can be viewed as an amenity or as unsightly, depending upon the contours of the mudflats and extent of vegetation. However, the primary disadvantage to locating a wetland within the Mission Bay project site is the impact of high-density development upon wildlife use. Noise, water pollution, water-borne trash, and human intrusion all add to reduced wildlife habitat value. While many of these impacts can be reduced during the planning process, one cannot expect to create a natural situation within an urbanized city. It is clear that the creation of wetland habitats at Mission Bay is possible, however, it would require that diverse and buffered areas be created which appeal to a limited number of wildlife species accustomed to human impacts.

The actual location of a marsh habitat relative to new development also must take into account: (1) the effect of a marsh (positive or negative) on property values; (2) the

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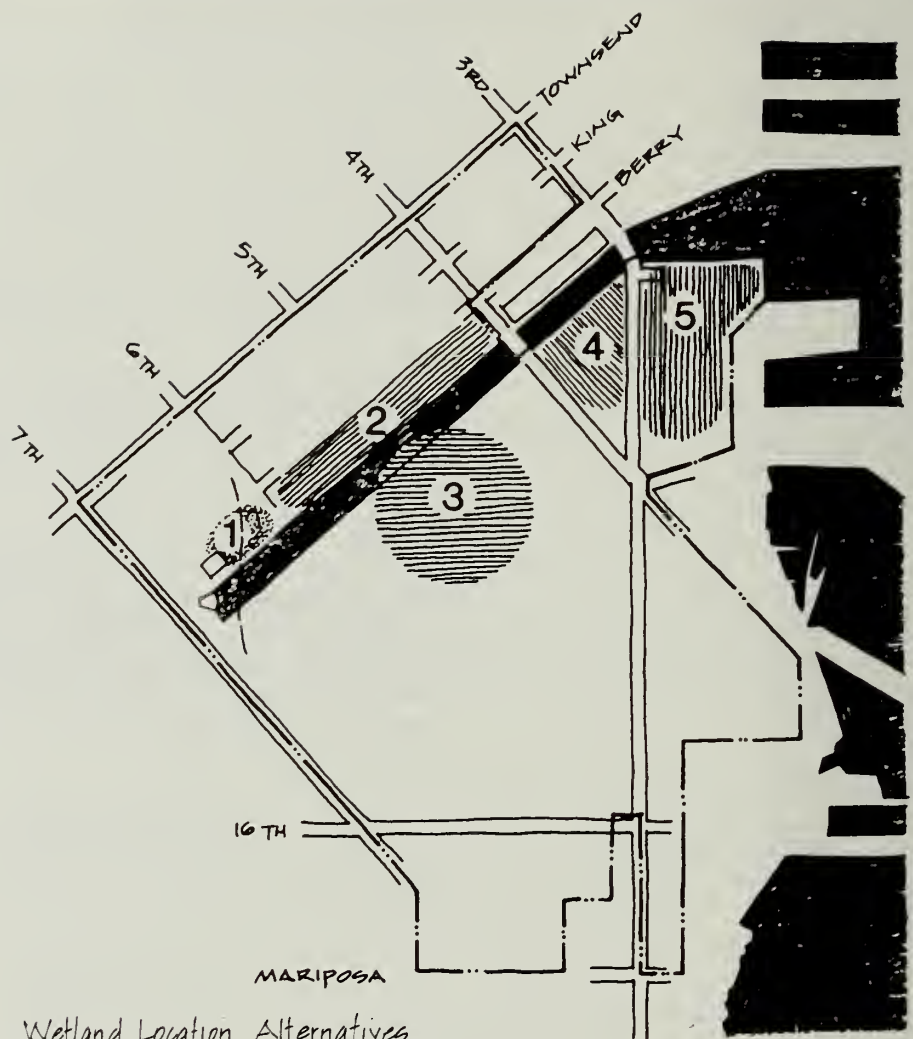
prospect (to be analyzed) that expanded ground water table fluctuations may undermine building foundations on a marsh perimeter, and (3) the need to control the impacts of sewage overflows and decaying vegetation on exposed mud since these can lead to unpleasant odors.

2.9.4 Wetland Site Alternatives

In the course of the design considerations for the open space element, a number of possible sites have been suggested for the wildlife area within a tidal wetland park. In addition, several questions have arisen over the size, configuration and the quality of habitat which could be created under certain acreage limitations. The purpose of this section is to provide an analysis of the various site proposals.

Five alternatives for the location of the tidal wetland park have been suggested in the design phase of the Mission Bay plan. Without discussing the physical constraints to the creation of tidal wetlands at various locations, this report will focus on the advantages and disadvantages of each of the locations in regard to wildlife usage. The alternatives that have been suggested are:

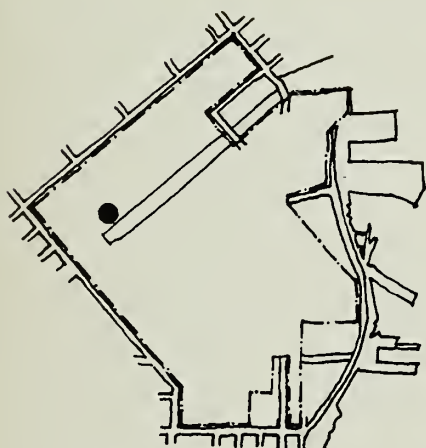
- Alternative 1: Beneath and east of the I-280 overpass at southwest end of Channel
- Alternative 2: Northwest side of Channel along Berry Street
- Alternative 3: Southeast side of Channel between I-280 and Fourth Street
- Alternative 4: Between Third and Fourth Streets
- Alternative 5: Mouth of Channel adjacent to Pier 48



Wetland Location Alternatives

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2.9.4.1 Alternative 1



Alternative 1

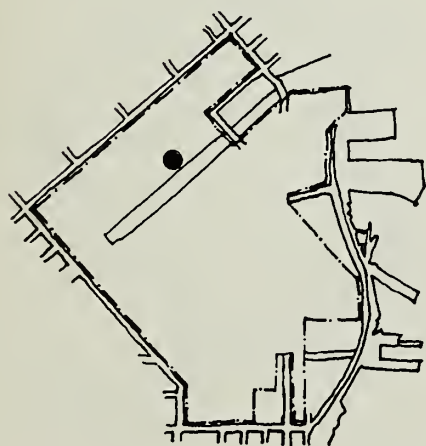
The advantages of Alternative 1 would include: (1) use of a location unsuitable for other uses; (2) possible shallow water habitat due to siltation at head of channel: shorebird habitat; and (3) isolated habitat around bridge support pilings.

Disadvantages include: (1) the site available is too small; (2) shading by highway supports would limit growth of plants; (3) limited wildlife use due to distance from the Bay and disturbance from surrounding uses; and (4) water quality problems due to the large sewage overflow structures nearby.

Conclusion: Despite the advantages of isolation, the shading effect would significantly limit vegetative cover and the use of the site by wildlife. The primary habitat created would be bare mudflats which might attract a few shorebirds. The noise of the freeway would disturb many other uses of the wildlife area, including human observation of birds. The freeway overpasses would have to be significantly rerouted to eliminate the shading and noise effects.

Habitat Configuration and Size: The optimal use of the site would be the creation of islands. High siltation rates can be expected at the end of the channel and broad mudflats would eventually form. Some debris control would need to be initiated. Due to the relatively low habitat quality, a sizeable acreage would be needed to overcome noise and limited vegetative cover.

2.9.4.2 Alternative 2



Alternative 2

Alternative 2 would: (1) provide greater width to the Channel for buffer and (2) create a linear park with "hard" and "soft" edges.

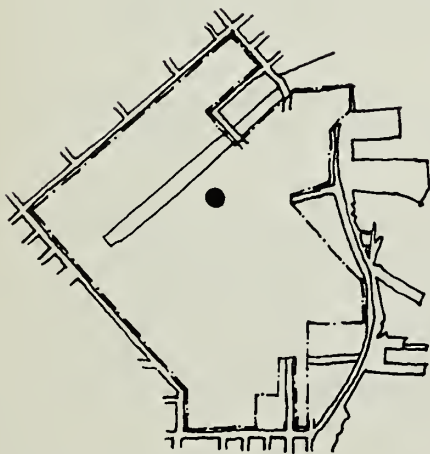
However, Alternative 2 would be (1) adjacent to Berry Street traffic and anticipated higher density development; and (2) represent restricted ability to create large embayments/peninsulas.

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Conclusion: The expansion of tidal wetland in this area could be done with a greater buffer from human activity, using the central portion of the Mission Creek channel. This might encourage greater waterfowl use of this Channel. A major restriction is the narrowness of this area and thus, slopes would have to be steep, edge treatment primarily "hard," and the establishment of vegetation more difficult due to steepness of slope. It might be best to consider this side as more of a pedestrian walkway area, with an extensive recreational element, while still providing a buffer from the central channel area.

Habitat Size and Configuration: The current location of Berry Street and the China Basin Building property limit the size of this area to about ten acres. The most appropriate configuration would be narrow channels separating some low islands with more gentle slopes towards China Basin Channel. This would create a buffer for wildlife in China Basin Channel.

2.9.4.3 Alternative 3



Alternative 3

Alternative 3 would provide: (1) greatest flexibility for shape and configuration of wildlife area; (2) slope can be varied for various plant communities and shorebird feeding areas; and (3) it would be a protected area from waves and therefore suitable for marsh stabilization. This is not considered a desirable location for a wetland from an urban design standpoint. The Central Channel will be a focal visual feature for Mission Bay and South of Market and it is preferable to implement open space and/or water amenities there that are urban in character and of great visual quality all of the time.

There could be (1) high human interference due to residential area nearby; (2) there would be need to design in houseboat marina area; and (3) this location would require removal and replacement elsewhere of the large sewer box under Channel Street.

Conclusion: This location offers substantial freedom in design features from small embayments to larger vegetated areas. It would be possible to consider vegetated marsh areas along the shoreline, buffered from human and pet intrusion by physical

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barriers, i.e., fences, or landscaped barriers. Soft edges could be more easily included here if greater buffer distance is created. The creation of small tidal embayments that were exposed at low tide would attract substantial bird use and hence, human observation opportunities. Furthermore, marsh plant growth here would be more luxuriant due to the protected nature of the site and the reduced salinities due to runoff into the China Basin Channel.

Habitat Size and Configuration: Due to the flexibility of this portion of the site, high habitat quality could be created. If desired, up to 15 to 20 acres of tidal wetland could be created here with opportunities for human observation at various locations. Due to intense human use to the south, sufficient buffer zones would need to be created. A total of at least 24 acres would be needed, including buffer areas.

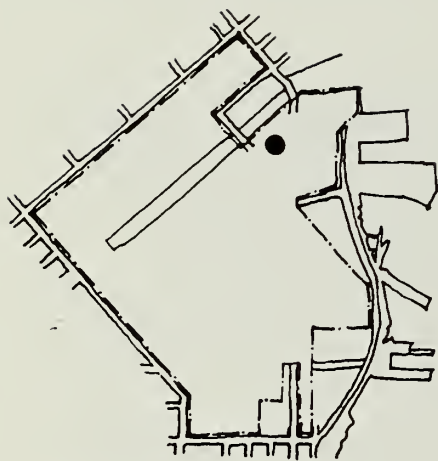
2.9.4.4 Alternative 4

Alternative 4 is characterized by: (1) isolation from high residential densities possible; (2) good tidal circulation; and (3) the opportunity to provide a "theme" entrance to site.

However, (1) it would be adjacent to high traffic areas; and (2) the configuration would be limited by street alignment.

Conclusion: This site, if fully developed as a tidal wetland park, could be well defined within and bordered by the street configuration. With the appropriate use of berms and vegetation, noise problems could be reduced. The location of the China Basin Building is a noise buffer from the traffic along the north side. The good tidal circulation would provide better water quality than in other portions of the site and enhance fish and food items for birds.

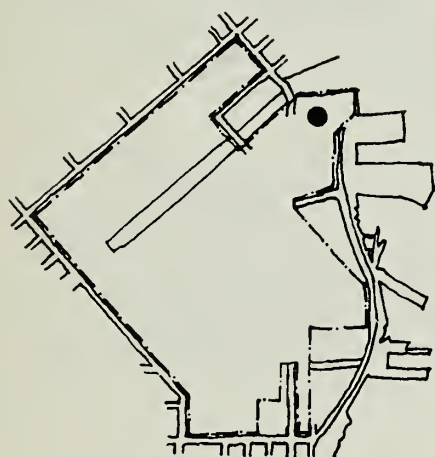
Habitat Size and Configuration: Both shoreline treatments and islands are possible at this location. It might be desirable to create a breakwater along the main channel to provide some protected water area within this site.



Alternative 4

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2.9.4.5 Alternative 5



Alternative 5

Alternative 5 would have: (1) full connection with open water and Bay wildlife habitat; (2) greater isolation from human impacts than other sites; and (3) considerable flexibility for shape and configuration of a habitat area; but it would have (1) an unprotected shoreline that may lead to erosion problems; and (2) a lesser role in bringing wildlife into China Basin Channel.

Conclusion: From a wildlife perspective, this site would support the greatest amount of wildlife due to its isolation and proximity to the Bay. It would probably support greater fish and invertebrate use and have limited water quality problems. Its primary disadvantage would be the construction costs of breakwaters or riprap to protect the developing marsh from wave and storm action.

Habitat Size and Configuration: A broad, vegetated wetland with some broad sloughs would provide the most protection for wildlife at this site. Islands would not be necessary, as human use could be minimized at this site. Size would range from 15 to 20 acres for optimal habitat.

Other opportunities exist to combine two or more of the above-mentioned alternatives, as is suggested in Section 4.0.

2.10 Housing

2.10.1 Assumptions

The following pages illustrate ways to create a residential neighborhood in Mission Bay. The rationale for the general approach, its relation to the historic neighborhoods of San Francisco, the ways in which housing in Mission Bay must respond to conditions which are different from those which created traditional neighborhoods and considerations of cost and affordability have been discussed in previous Mission Bay reports. This document addresses the ways in which housing affects and constrains the other components of the overall plan for Mission Bay.

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Studies summarized in the Findings Report and the San Francisco Housing Types Supplement (November, 1985) have given shape to a set of premises and assumptions for housing for Mission Bay. The following considerations are incorporated in the housing studies which follow:

Neighborhood Commercial: The new residential neighborhood must include a service and retail commercial element integrated within it. A combination of commercial space with recreational value next to open space may benefit both uses. The models for this neighborhood commercial sector are Clement Street or Chestnut Street with housing over continuous retail frontage. The residential density for this mixed-use portion of the plan will be a maximum of 40 units/acre.

Family Housing: Some family housing is necessary and desirable in the Mission Bay neighborhood. Family housing in San Francisco is typically defined as three bedroom units with contiguous open space. Housing of this type can be built at a maximum of 55 units/acre.

Neighborhood Open Space: There should be small public access mini parks and green urban squares within the residential neighborhood directly next to dwellings but not a part of the private domain of residential developments. These should occupy about 25 percent of each residential block.

Coverage: Not including the public open space described above residential buildings should not exceed the 75 percent lot coverage historically defined as a maximum by the San Francisco Planning Code. Parking coverage, however, may exceed 75 percent below residential floors. Garage roofs in housing blocks would be designed for active use as open space.

Building Heights: Housing heights will vary from three to eight stories. the site could be covered with eight-story housing blocks however several factors suggest this is not appropriate: (1) a lower density San Francisco-type neighborhood is desirable; (2) taller buildings require high cost construction and more amenity to market resulting in loss of affordability; (3) views from surrounding neighborhoods would

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be blocked; and (4) the development could take on a monotonous character.

Parking Ratios: Each increment of housing should provide covered parking at a ratio of one car per dwelling.

Perimeter Blocks: Housing which reconstitutes the character of traditional San Francisco neighborhoods must be of a perimeter block configuration with streets and public open spaces defined by continuous street frontages with frequent pedestrian access to buildings from streets.

Housing Design: Actual design and densities of housing will necessarily respond to market demand and amenities available.

Translation of these assumptions into realistic assessments that can be applied to the land leads to use of combinations of the housing typologies and block patterns illustrated on the following pages.

Studies of housing typologies, their cost index and densities which were presented in The Findings Report (November 1985) and its supplement, Housing Types (November 1985) indicate that for the two areas north and south of China Basin Channel there are two optimal densities which it is not possible to exceed without substantially raising the cost of housing or the amount of required subsidy for both affordable and market rate units.

(no page 4b)

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The basic low-rise block types shown in Section 2.10.2 typically accommodate 85 units/acre. Family units, luxury townhouses and housing combined with retail have lower densities. The relative quantities of these housing types can only be determined using a possible land-use plan, so it is important to express the density of the low-rise neighborhood at a range of 78-85 units/acre at this stage. Optimum densities, then, can be expressed as follows:

Areas of unstable soil south
of China Basin Channel 78 to 85 dwelling units/acre
optimal density

Areas of stable soil north
of China Basin Channel 120 dwelling units per acre
optimal density

It is possible to revise these figures upwards if one makes optimistic assumptions about the future ability and willingness of San Franciscans to pay relatively high prices for housing in Mission Bay or for the creation of future housing subsidies which do not now exist. If you make these assumptions, densities would be as follows:

North of Channel 150 dwelling units/acre

South of Channel 65 percent at 72 to 80 dwelling
units/acre
35 percent at 120 dwelling
units/acre

Housing densities in the low-rise neighborhood could decrease if substantial land south of China Basin Channel were devoted to higher density mid-rise housing. Mid-rise housing for a variety of reasons is not well suited for family units and would cause the lower density family housing desired by the city to be compressed into a smaller area. Using the figures above, the chart below shows the alternative acreage requirements for housing. The chart assumes 10 acres of housing land north of China Basin Channel.

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Housing Acreage Required
(Exclusive of Streets, Public Squares)

	<u>7,200 D.U.</u>	<u>8,500 D.U.</u>
Optimum Scenario	80-87 A.C.	95-105 A.C.
Optimistic Scenario	71-75 A.C.	84-88 A.C.

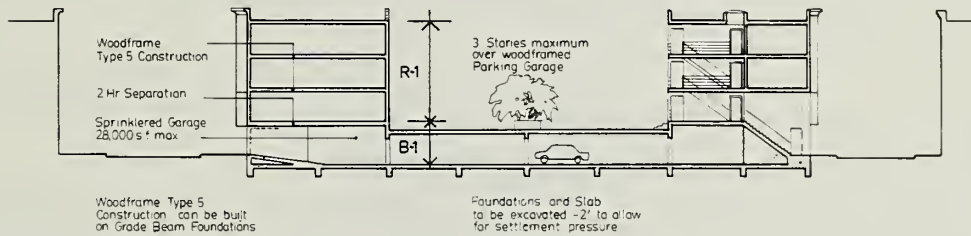
2.10.2 Housing Construction Types

The page opposite illustrates two basic construction types upon which the optimum densities discussed on the previous page are based. These are not the only possible construction types for housing in Mission Bay, but studies to date and the analysis of existing San Francisco housing typologies indicates that these two types constitute cost effective means of achieving the housing goals which have been defined for the project.

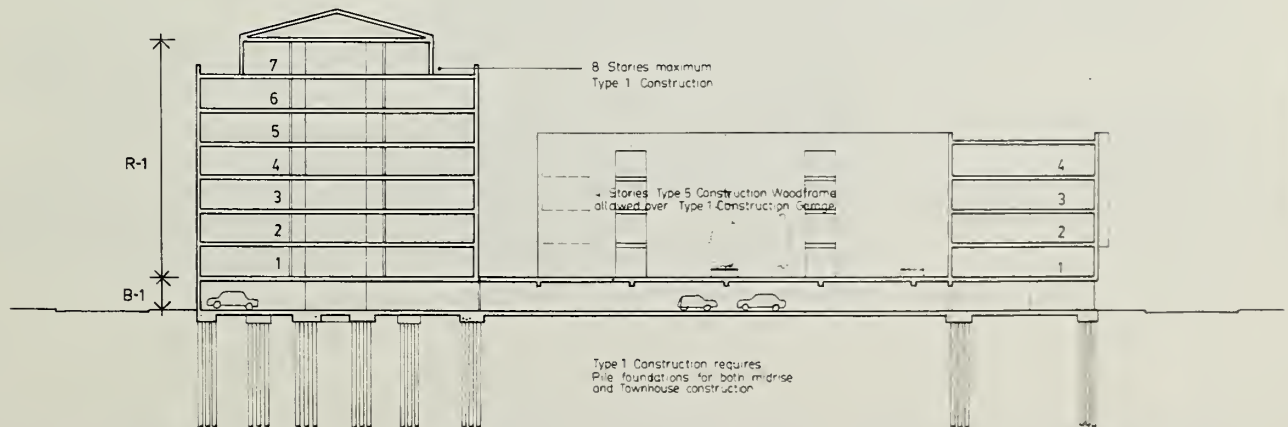
2.10.2.1 Low-Rise Construction Type

The low-rise construction type illustrated here is appropriate for areas of unstable soil south of China Basin Channel which have experienced non-uniform settlement, or where soils can be compacted prior to construction. This type can achieve moderately high densities (comparable to North Beach) at relatively low cost and achieve the goal of creating a residential neighborhood in Mission Bay that has the scale and ambience of traditional San Francisco neighborhoods. The cost savings inherent in this construction type are the result of the following factors:

- o Foundation costs are relatively low.
- o Aggregated parking in large wood frame garages is both efficient and inexpensive to construct and garage roofs can be used for central open space.
- o Elevators are not required.



LOWRISE NEIGHBORHOOD CONSTRUCTION AND CODE REQUIREMENTS, FOUNDATION CONDITIONS



MIDRISE NEIGHBORHOOD CONSTRUCTION AND CODE REQUIREMENTS, FOUNDATION CONDITIONS

2.0 PLAN DETERMINANTS

- o Horizontal circulation is minimal and there are no corridors.

The potential advantages of this construction type in terms of neighborhood quality are the following:

- o Buildings are less than 40 feet high, permitting courtyards and alleys to have the dimensions of traditional courtyards and alleys in the city.
- o The foundation type requires the parking garages to be located two feet below existing grade. This permits the first level of units to be approximately seven feet above grade. This height is advantageous for walk-up units and helps give a street quality analogous to Victorian houses rather than many recent apartment buildings which frequently have excessively high bases.
- o Aggregated parking limits curb cut and provides substantially more on-street parking than is typical of newer housing in the city.
- o Walk-up entrances provide an animated streetscape like that of traditional neighborhoods.

2.10.2.2 Mid-Rise Construction Type

The mid-rise construction type shown here is appropriate for most of the area north of China Basin Channel and potentially a portion of the land south of the Channel if developers are willing to commit some land to a more expensive housing type. This type combines midrise construction with low-rise construction like some other recent San Francisco projects (see Housing Types, November 1985). One hundred twenty units per acre is the maximum density that can be achieved with one level of parking.

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2.10.2.3 Other Construction Types

There are other potential housing configurations not illustrated here which may have some limited applicability to Mission Bay but it is assumed in the pages that follow that the two drawings shown here will constitute the prevalent configurations for housing. Other types include the following:

Two- and three-story wood frame housing with open parking at 45 units/acre. This configuration is the basic type in the Western Additional Redevelopment Area and several recent affordable projects in the City are of this type. The current plan alternatives assume that the 45 units/acre density is too low for Mission Bay and that open parking lots will be unacceptable. Alternative means for providing affordable units without attributing the cost of structured parking to them are discussed on the following pages.

Four stories of wood frame with concrete parking. This type would be appropriate where soil conditions dictate pile foundations rather than the grade beam foundation assumed for wood-frame garages at some places in the plan, but it has some apparent disadvantages. Density may be somewhat higher than the three story and wood frame parking solution but costs are considerably higher. In addition to the substantial added cost of concrete parking garages there are added costs for pile foundations, elevators and corridors. Density increases are limited because alleys and courtyards must be wider to accommodate additional building height.

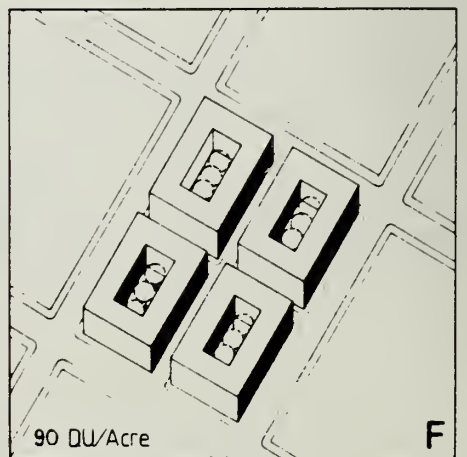
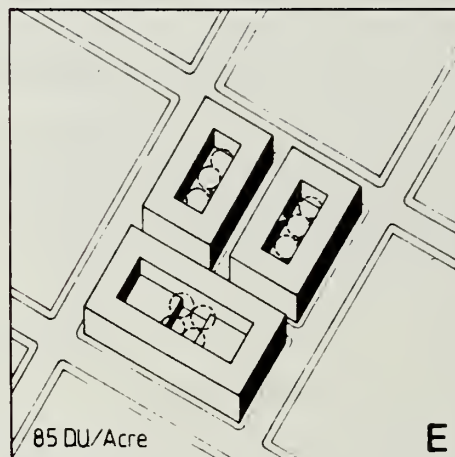
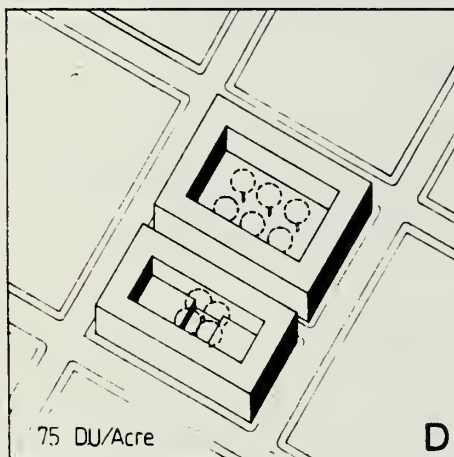
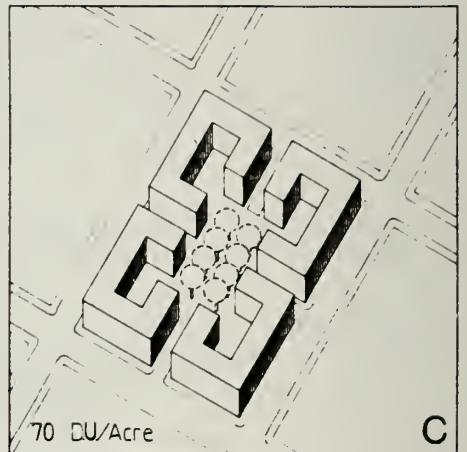
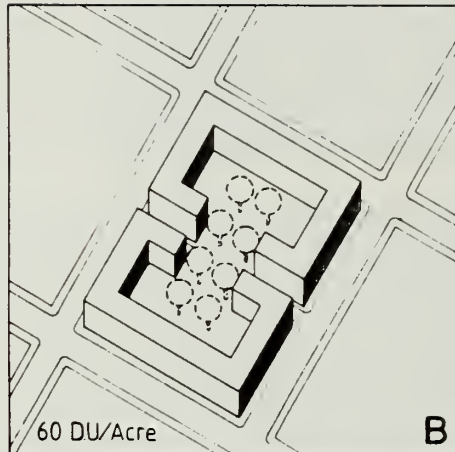
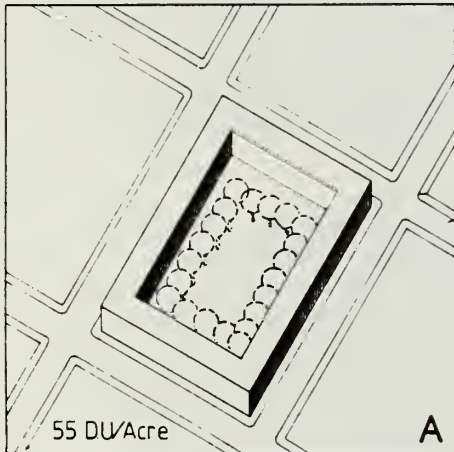
All midrise. It may be desirable to build to the absolute maximum density achievable within the eight story height limit for limited portions of the site. This would imply an all midrise scheme with two levels of parking at approximately 150 units/acre.

2.10.3 Alternatives for Maximizing Density

2.10.3.1 Density Studies

^{next}
This page illustrates a basic method for obtaining maximum densities with low-rise housing types. The sketch (a) showing

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55 dwelling units/acre shows a basic perimeter housing block with three stories of housing over parking. Assuming 850 square foot units and 1:1 parking, the density of this configuration would be 50 units/acre. The subsequent sketches show how increasing the perimeter of the block by subdividing it with alleys would increase this basic density. Pushing this principle to the maximum density with the criterion of 75 percent maximum lot coverage would create the pattern shown at the lower right which contains 90 units acre and a sub-scale of residential alleys similar to older San Francisco neighborhoods. As densities increase, views and natural light are constrained, especially for units fronting on alleys. These densities are based upon an 850 square foot average unit size with no provision for family housing or neighborhood commercial.

2.10.3.2 Alternate Block Plans

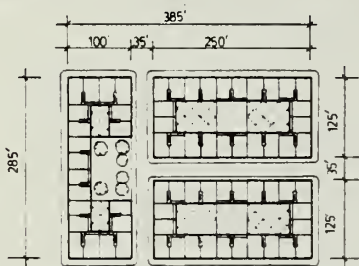
Within the established module of increments of 50 feet plus the 35 foot width of an alley, we propose a block dimension of 385 feet $\pm$ 50 feet X 285 feet $\pm$ 50 feet. Two of the 385 foot blocks plus a street would coordinate with an 825 foot South of Market block.

The 385 foot X 285 foot block would also be flexible enough to suit a variety of housing layouts at the desired low-rise neighborhood density of approximately 85 du/acre. It could accommodate stacked walk-up flats, townhouses, corridor access units, amongst many others. Alleys could run in both directions. Small midblock public open squares could also be created.

The alleys would allow substantial on-street parking for visitors or for the affordable units. They also would recall the pattern of San Francisco neighborhoods. Four blocks could be arranged to create a public square or neighborhood park where they intersect by omitting a part of the block. (See block layouts.)

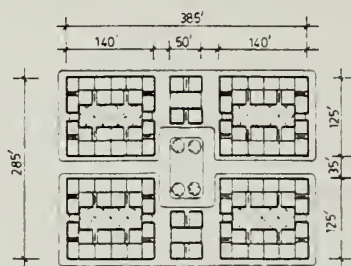
2.0 PLAN DETERMINANTS

BLOCK TYPE 1



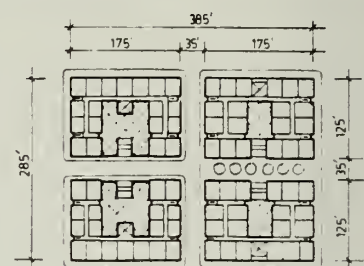
STACKED WALK-UP FLATS OR FAMILY UNITS
55-85 DU/AC

BLOCK TYPE 2



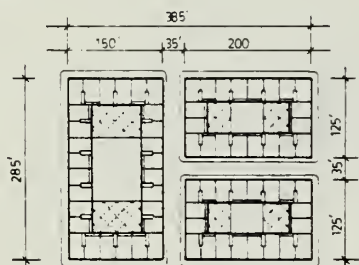
STACKED WALK-UP DUPLEX UNITS AROUND COURTS
85 DU/AC

BLOCK TYPE 3



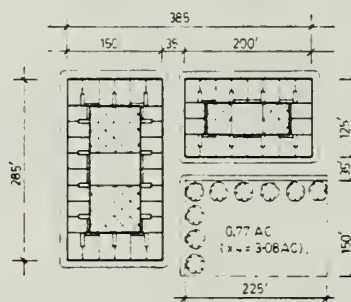
ELEVATED ELDERLY PERSON UNITS OR DUPLEXES
55-85 DU/AC

BLOCK TYPE 4



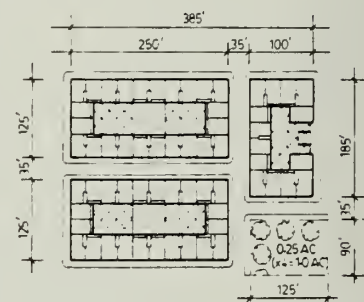
STACKED WALK-UP FLATS OR FAMILY UNITS
55-85 DU/AC

BLOCK TYPE 5



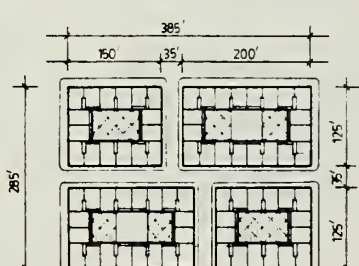
HOUSING AROUND LARGE NEIGHBORHOOD SQUARE

BLOCK TYPE 6



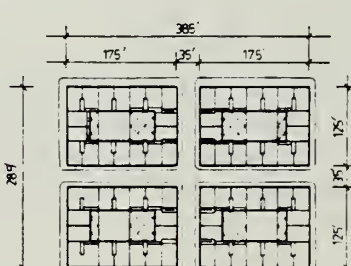
HOUSING AROUND SMALL NEIGHBORHOOD SQUARE

BLOCK TYPE 7



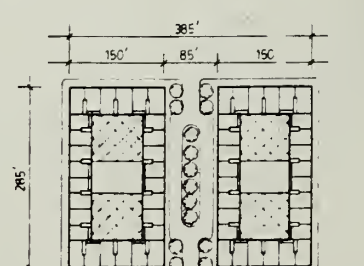
STACKED WALK-UP FLATS OR FAMILY UNITS
55-85 DU/AC

BLOCK TYPE 8



STACKED WALK-UP FLATS OR FAMILY UNITS
55 DU/AC

BLOCK TYPE 9



STACKED WALK-UP FLATS OR FAMILY UNITS
45-75 DU/AC

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2.10.3.3 Coordination Between the Proposed Mission Bay Block Types and the Existing South of Market Block Types

Use of the South of Market grid in Mission Bay yields the most efficient housing blocks. This norm is described below. Variations from it represent less housing efficiency. If the street grid of the residential neighborhood aligns with the South of Market, it is necessary and desirable to coordinate block dimensions with the existing street grid. The page opposite illustrates the options described below. Two of the proposed 385 foot long Mission Bay blocks can fit into the length of a South of Market block.

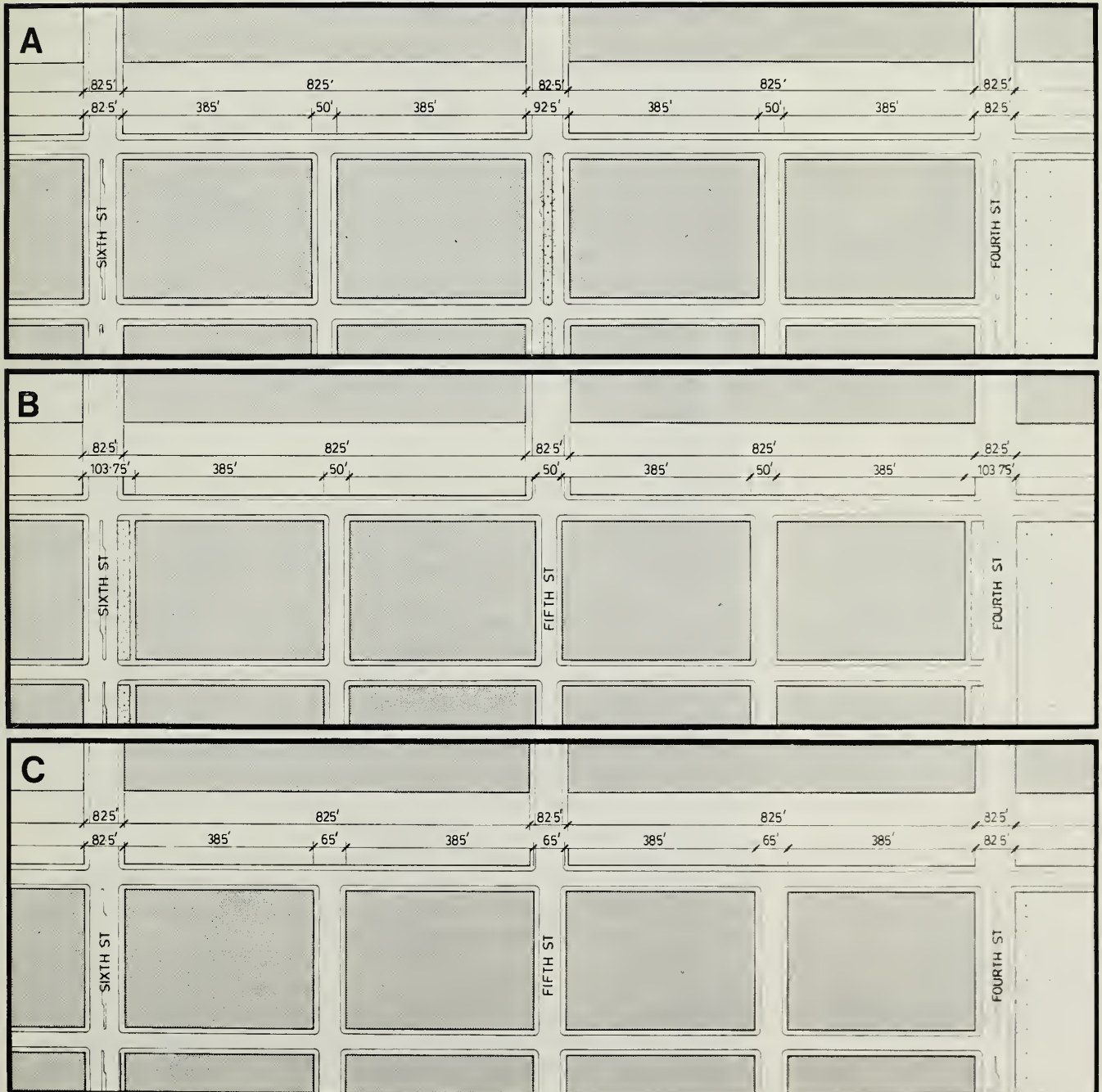
There are three options for coordinating the blocks south of the Channel between Fourth and Sixth Streets.

Option A would maintain the street lines of Fourth and Sixth Streets, create two new North-South residential streets at 50 feet each and have a 92.5 foot right of way for the continuation of Fifth Street. This could contain a landscaped median strip.

Option B would include a landscaped buffer on the inner edge of Fourth and Sixth Streets to shield housing from the busy traffic. All the remaining North-South Streets, including the new Fifth Street, would be 50 feet.

Option C would provide three equal North-South Streets at 65 feet including the new Fifth Street and maintain the street lines on Fourth and Sixth Streets.

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2.10.4 Sample Housing Types

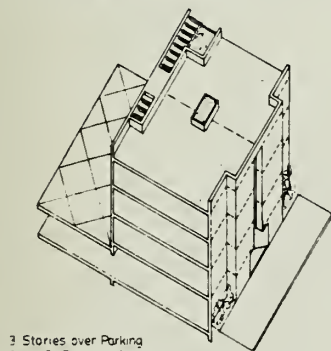
The three housing types illustrated on the following page are illustrative of a larger set of potential housing types that could all be accommodated within the characteristic 25 foot San Francisco housing grid. Previous reports have discussed the importance of this traditional unit of measurement in establishing the character of San Francisco neighborhoods. The great range of San Francisco housing types that have historically been accommodated within this grid show the inherent flexibility of the system. 25 foot wide units can be one, two or three stories high, single aspect or double aspect and vary in depth from 20 feet to 75 feet. A plan based upon traditional block, street and alley types and 25 foot building widths can accommodate any segment of the housing market that a particular developer may wish to serve at any particular time.

On the next page is a drawing showing four housing blocks. Drawings A, B and C on that page show how the low-rise housing types combine to form block types that are like those of traditional San Francisco neighborhoods. All three are 385 feet x 285 feet or 2.52 acres. Type A shows 216 stacked walk-up flats at 85 dwelling units per acre. There will be 216 covered parking spaces and approximately 90 "on-street-parking" spaces. Type B is based on duplex walk-up units over flats and has the same density as Type A. Type B includes a 5,500-square-foot public mid-block mini-park. Type C has walk-up family units over flats. There are 148 units at a density of 55 units per acre. Block D shows a combination of mid-rise and low-rise buildings at a density of 120 dwelling units per acre. A block 385 feet x 140 feet or 2.12 acres, accommodates 264 units. this drawing is illustrative of building mass and open space, and unlike the others, it could not plug direction into the plan since mid-rise buildings will be haped by site-specific considerations.

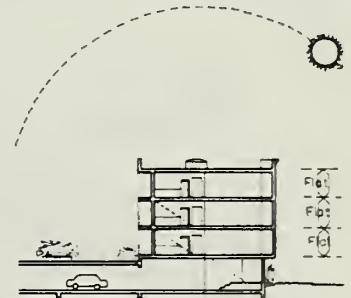
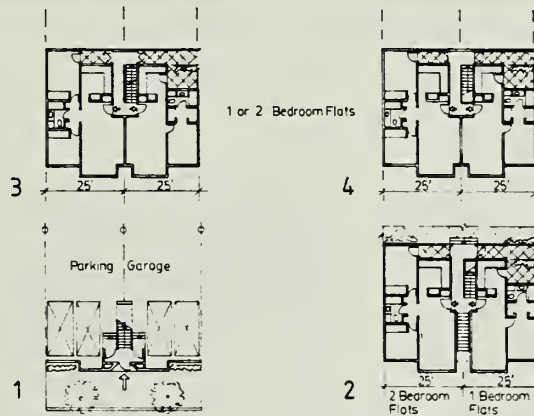
As the planning for Mission Bay progresses the illustrative housing types shown here will be joined by others to form a catalogue of unit types serving all potential market segments and appropriate for and compatible with land use plans. Each of these unit types will be interchangeable within the basic

2.0 PLAN DETERMINANTS

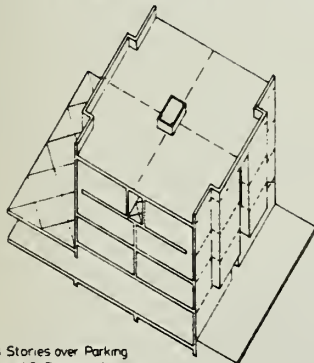
STACKED WALK-UP FLATS



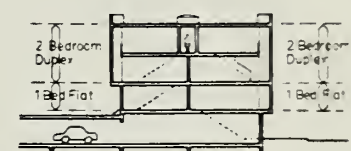
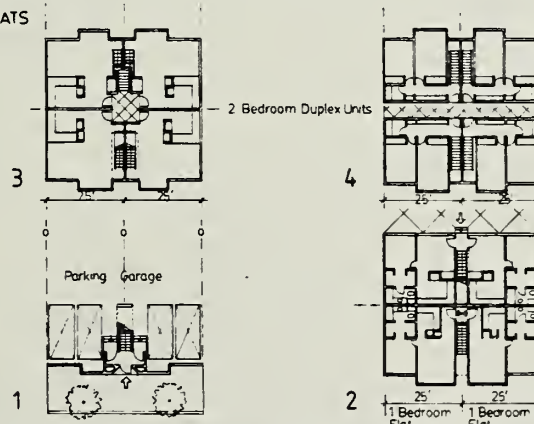
3 Stories over Parking
1 and 2 Bedroom Units
Double Aspect



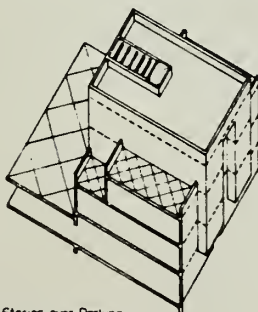
STACKED WALK-UP DUPLEX UNITS OVER FLATS



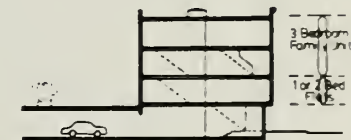
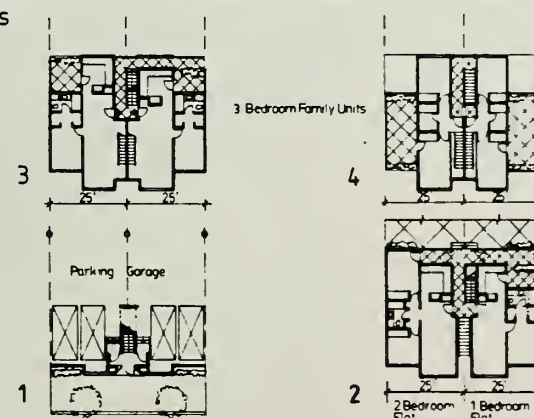
3 Stories over Parking
1 and 2 Bedroom Units
Single Aspect



STACKED WALK-UP FAMILY UNITS OVER FLATS

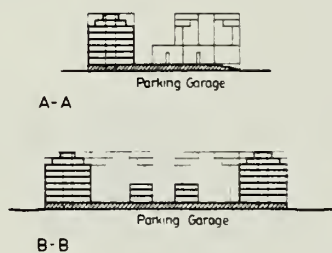


3 Stories over Parking
1, 2 and 3 Bedroom Units
Double Aspect



2.0 PLAN DETERMINANTS

SECTIONS



MIDRISE BLOCKS WITH TOWNHOUSES

DENSITY 120 UNITS PER ACRE

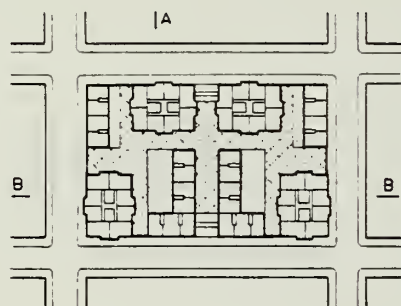
No OF UNITS 264

BLOCK SIZE 385' x 240' (2.12 AC)

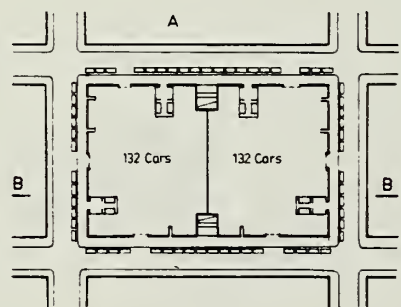
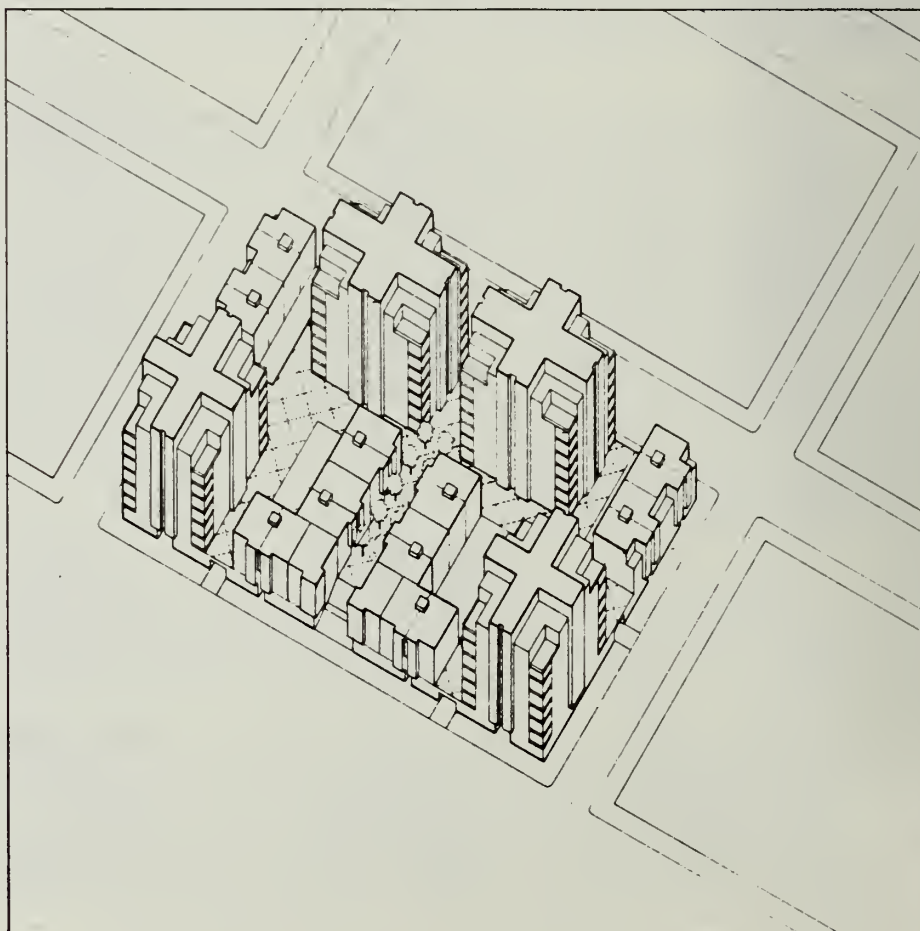
UNIT TYPES 1 and 2 BEDROOM FLATS IN TOWERS
1 and 2 BEDROOM TOWNHOUSESPARKING 264 GARAGE SPACES
60 ON STREET SPACES

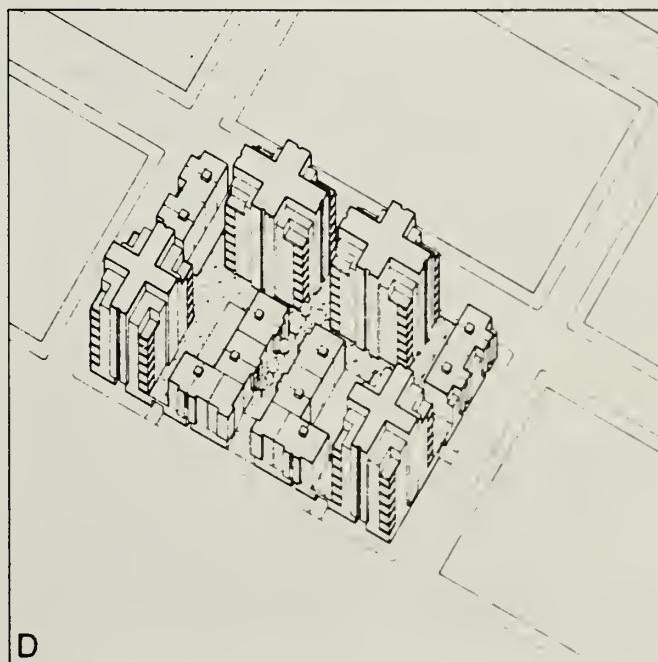
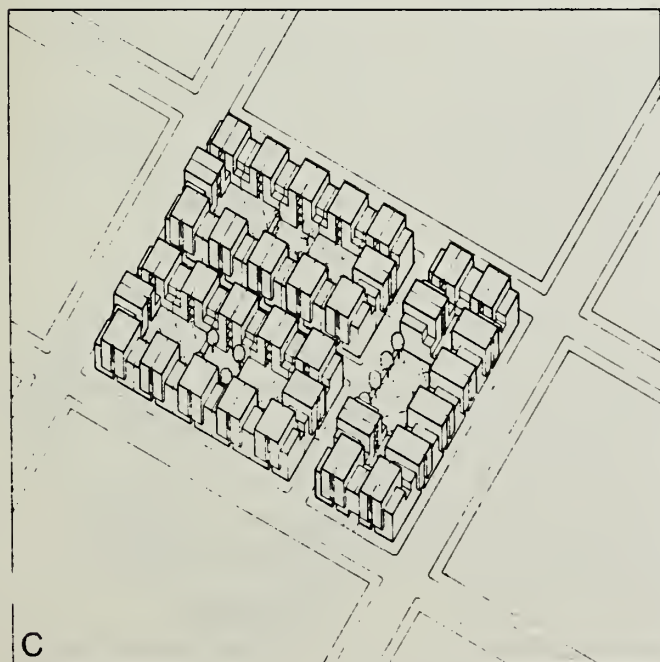
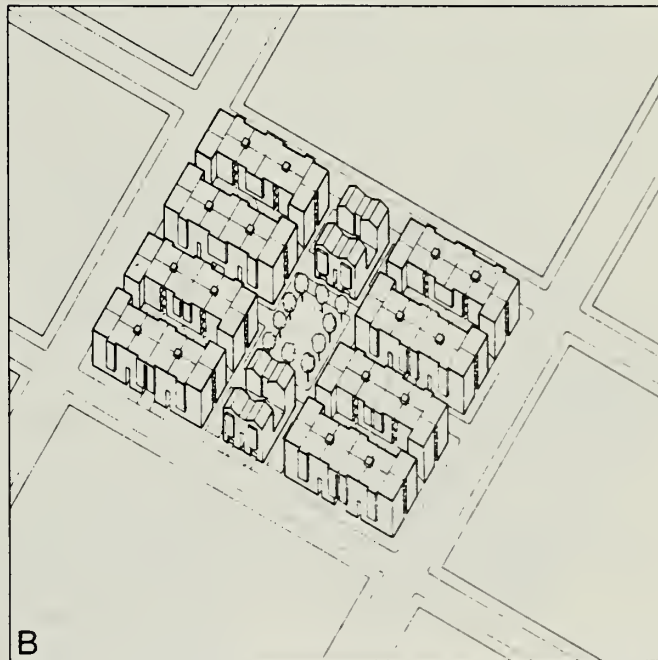
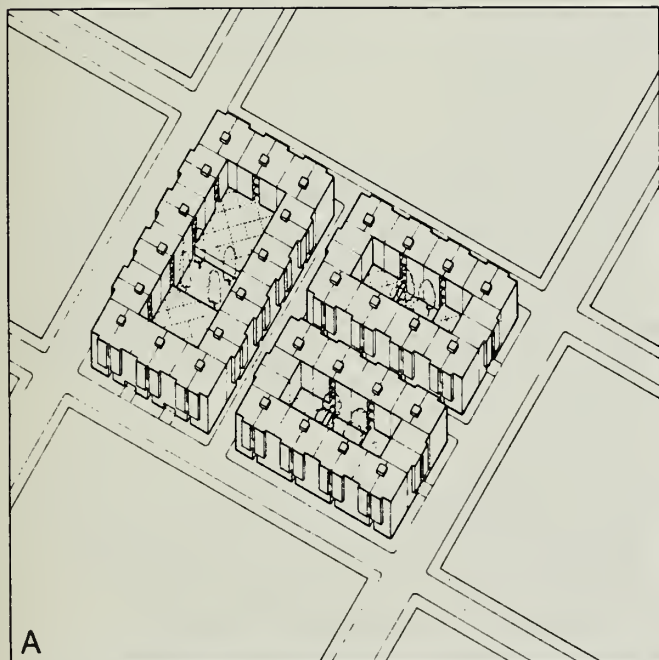
OPEN SPACE SEMI PUBLIC SPACE OVER GARAGES 27,000 sf (0.61 AC)

UPPER LEVELS

264 Dwellings / 120 Units per Acre
(Note: 385' x 240' Block North of Channel)

GROUND LEVEL

60 On-Street Parking Spaces
264 Garage Spaces



2.0 PLAN DETERMINANTS

armature of streets, blocks, alleys, squares and courtyards that constitute the housing plan.

2.10.5 Houseboats and Boats

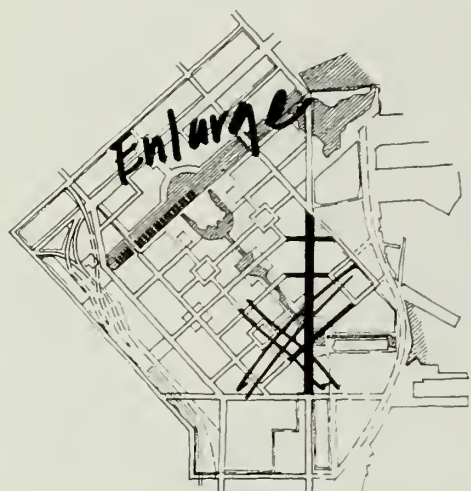
At present, approximately 20 houseboats and 35 recreational boats occupy slips within China Basin Channel. They are members of the Mission Creek Harbor Association. They have leases for use of this area from the Port which are renewed (how often?). The houseboats and recreation boats could remain in their present location, be moved to a new location in the Channel or be displaced from the Channel.

2.10.5.1 Present Location

The present dock on the south side of the Channel extends _____ feet from west of Sixth Street to a point midway between Fourth and Sixth Street. The dock is periodically maintained by the Harbor Association with substantial improvements requiring regulatory agency permits. The Channel is maintained by the Coast Guard as a navigable waterway. The houseboats and boats in their present location would occupy the area of the primary and central open space amenity for the Mission Bay site. Improvements being considered along the Channel could contrast sharply with the visual and functional characteristics of this small community. A bridge providing a southerly extension of Sixth Street would be precluded by retention of the existing configuration.

2.10.5.2 Relocated Community

Substantial social and economic costs are likely if the houseboat/boat community is relocated within the site. Lease negotiations would be required from the permitting agencies, probably resulting in shorter term (five-year) leases and consequently less perceived security for these residents coupled with additional periodic renegotiations. The Bay Conservation and Development Commission would no longer classify the houseboats as a "grandfathered" use entitled to continuation in perpetuity.



Houseboats

2.0 PLAN DETERMINANTS

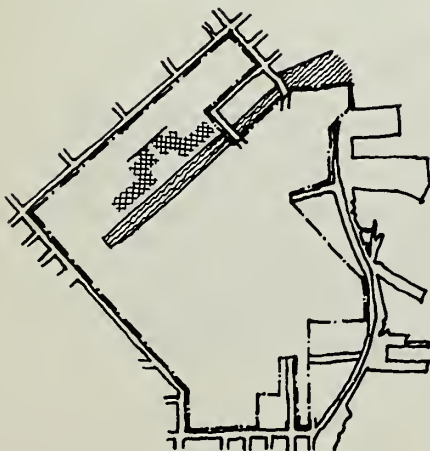
At present, the Channel is an amenity enjoyed primarily by these houseboat/boat owners. The intention of this planning process is to create an amenity at the Channel for Mission Bay and citywide enjoyment. Having a private community as this citywide centerpiece may not be compatible with urban design goals for Mission Bay or the boat community's desire for privacy and security. Opportunities for the relocation of some or all of the houseboats and boats within the Channel will be investigated.

2.10.5.3 Displacement of Recreational Boats

The proposed Mission Bay Objectives and Policies state that the Department intends to "Incorporate the existing houseboat community in the new development." (Objectives and Policies, page 3.) Displacement of houseboats, those boats on which people reside and which have registered sewer hookups, is not being considered. It is possible, however, that the recreational boats may be displaced and/or relocated to other marina facilities outside the Channel.

2.11 Retail Siting Requirements

Retail uses take a variety of forms. In a neighborhood context, numerous personal services, retail shops and eating and drinking establishments are frequently aggregated and used by pedestrians from houses nearby. At a larger scale, retail uses can be combined with community facilities used by several neighborhoods or cultural facilities enjoyed by residents citywide. Also, open space amenities adjacent to retail, especially eating and drinking establishments, may add value to such uses.

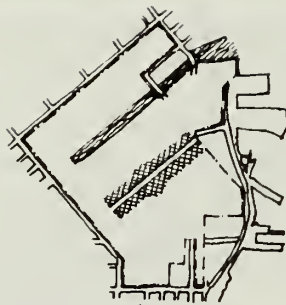


Retail North of Channel

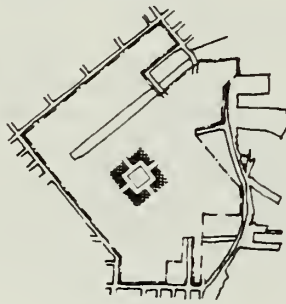
2.11.1 Retail North of the Channel

Since China Basin Channel is one of the most unique features of the site and in order to take advantage of its potential for amenity and centrality, some retail activity would be best located along its northern edge. Restaurants would have exposure to the sun and water. Shops could open onto pedestrian walks and retail uses could be mixed with many land and water related uses.

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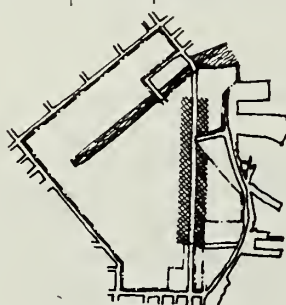
Retail-Neighborhood Street



Retail-Neighborhood Square



Retail-Linear Open Space



Retail-Arterial Street

2.11.2 Retail Along a Neighborhood Street

In the tradition of many San Francisco neighborhoods, retail uses at the ground level of a neighborhood street would create a delightful mixture of shops, restaurants, personal or business services, dwellings and community facilities. Retail street frontage, open space, community facilities and housing could be combined along a central neighborhood spine.

2.11.3 Retail Around a Neighborhood Square

Separate or in conjunction with a neighborhood street, retail uses could be located around a neighborhood square. As in other places in San Francisco, shops and restaurants could spill out onto a square or into an arcade at the edge of a square. A series of squares of different sizes along a neighborhood retail spine with housing, community facilities and open spaces could be combined along an urban street.

2.11.4 Retail Along a Linear Open Space

Retail spaces can be located along a linear open space in combination with housing, community facilities and all the amenities of landscaping and canals. With good public and automobile access to the retail uses, the neighborhood retail can have both the environment of a park and the access of a street.

2.11.5 Retail Along an Arterial Street

In many part of San Francisco retail uses are located along major arterial streets, but the environment created is not the most suitable for neighborhood retail. For instance, if there were retail uses along Third Street, the truck and automobile traffic would be too noisy and dirty for any of the retail activities to have outdoor activities. It would not be a pleasant pedestrian environment and higher speed traffic would discourage on-street parking. However, it would buffer housing from heavy traffic.

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2.12 Secondary Office

2.12.1 General Characteristics

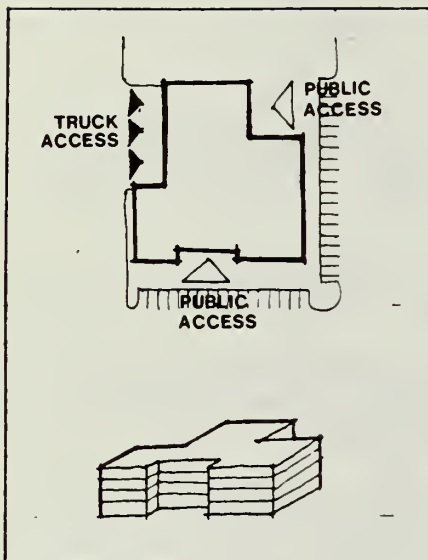
The prototypical characteristics of secondary office buildings determine appropriate locations on the site for such buildings. Those characteristics would be:

- o Predominantly, eight-story building heights, with opportunities for retail uses at street level.
- o Office sites should be completely accessible by public transit and accessible from Downtown and residential areas. Heavy traffic can be tolerated.
- o Open space and setbacks should include varying sizes of parks as usable open space. Secondary open space would be plazas and building setbacks. Landscaped alleys would be used as pedestrian circulation and for retail accessibility.
- o Siting of offices should occur adjacent to retail uses. Direct linkage to water features and China Basin Channel as well as views of downtown are desirable.
- o All parking would be in structures of no more than six stories.
- o Open space associated with office uses would occupy about 25 percent of office sites.
- o Large floor areas, such as 40,000 square feet, should be provided.

2.12.2 Site-Specific Determinants

The north of Channel area is appropriate for the above-mentioned reasons and because office development would benefit from the boulevard concept on King Street using landscaped setbacks for parking structures and/or buildings, as well as pedestrian circulation. Courtyards could open up from this linear parkway as entranceways to buildings. Also, this

2.0 PLAN DETERMINANTS



Large Scale R & D

area could be completely accessible for pedestrians from Mission Bay housing with Muni stops located along King or Townsend Street and parking structures located within each block for "key employee" parking.

The area adjacent to the I-280 interchange could be appropriate because of direct links via King and Division Streets to Showplace Square; Muni stops on King Street, parking structures located within one block and some on-grade parking. Offices could share facilities with R&D.

2.13 Research and Development (R&D)

2.13.1 General Characteristics

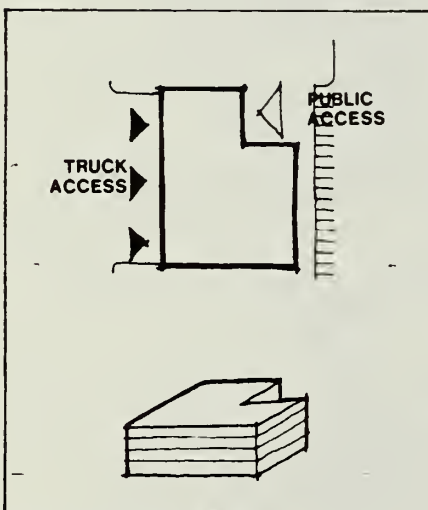
Several types of R&D building may be most appropriate in Mission Bay. Their general characteristics are described below.

- o Height: higher ceilings on first floors, four-story (45-foot) maximum building height
- o Public accessibility and visibility
- o Traffic access pedestrian and vehicular
- o Open space: about 13 percent of each site
- o Setbacks: landscaped areas along street
- o Parking: majority of parking in structures, some on grade

2.13.2 Alternative R&D Uses

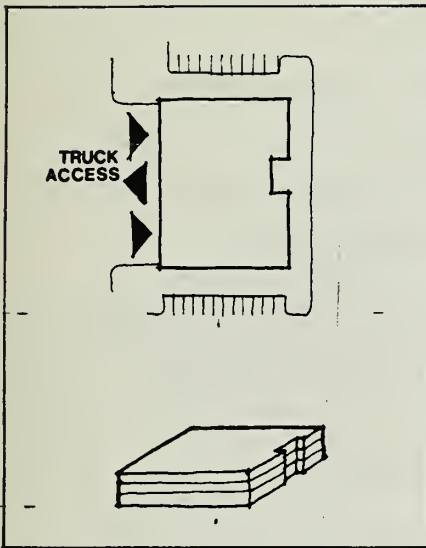
2.13.2.1 Large-Scale Retail, Wholesale, R&D

- o Height: four stories (45 feet)
- o Major public access: car, public transit, pedestrian



Light Industrial R & D

2.0 PLAN DETERMINANTS



R & D Only

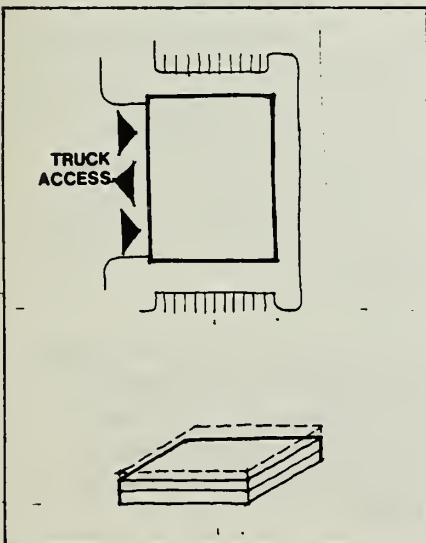
- o Limited truck access
- o Public open space: parks and plazas
- o Setbacks: generous, landscaped areas at streets

2.13.2.2 Light Industrial, R&D

- o Height: up to four stories (45 feet)
- o Some public access: car, public transit (employee and public visitors), pedestrian (employee and visitors)
- o Minor truck access
- o Some public open space at buildings, major open space centrally located in R&D area
- o Setbacks: landscaped setbacks at streets

2.13.2.3 R&D Only

- o Height: up to three stories (35 feet)
- o Limited public access: cars, public transit (employees, visitors)
- o Truck access for semi-trailers
- o Limited public open space at building, major open space centrally located in R&D area
- o Setbacks: combination of building setbacks and street trees

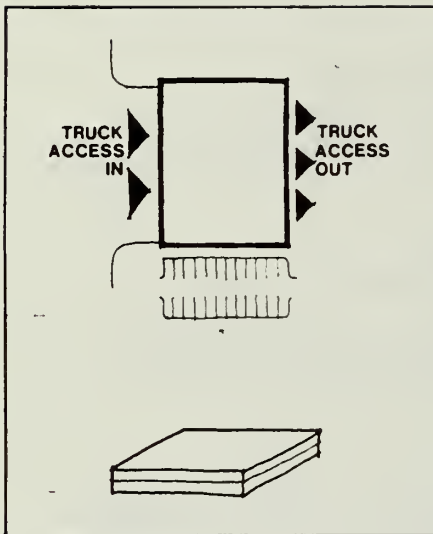


Maritime / R & D

2.13.2.4 Maritime, R&D

- o Height: up to three stories, preferably three (35 feet)
- o Limited public access: cars, public transit (employees); limited pedestrian access

2.0 PLAN DETERMINANTS

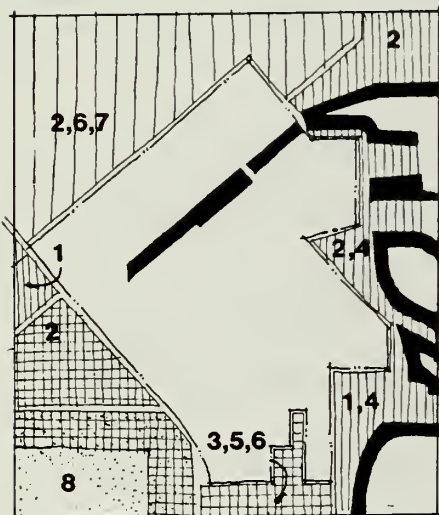


Light Manufacturing

- o Truck access for semi-trailers
- o Some opens space near building. Major open space centrally located
- o Setbacks: limited building setbacks and street trees

2.13.2.5 Light Manufacturing and Warehousing

- o Height: up to two stories (25 feet)
- o Very limited public access: cars, public transit (employees)
- o Major truck access for semi-trailers
- o Open space to be located centrally to serve all R&D areas
- o Setbacks: small setbacks and street trees



1. Large Scale Retail:
wholesale, discount, distribution, showrooms
2. Light Industrial:
printing, reprographics, photo labs
3. Research and Development:
medical, biotech, electronics
4. Maritime:
chandlery, boat repair
5. Light Manufacturing:
food processing, textile apparel
6. Warehousing
7. Secondary Office

2.13.3 Site-Specific Determinants

In San Francisco, it may be necessary to incorporate reduced FARs and some surface or non-structured parking on-site to compete effectively with suburban R&D sites. The largest single parcels for R&D use exist south of Sixteenth Street; they can accommodate several types of (campus) site layout, depending on use. There would be direct access from I-280 providing easy access for trucks. Of all Mission Bay, this area has most direct linkage with the existing industrial area. Some facilities such as parking may be shared.

The land adjacent to I-280 is in a narrow parcel due to railroad tracks, Muni tracks, and the existing Owens Street right of way. The resulting depth of lot is approximately 100 feet. There are good lots for smaller users of R&D space. In this location, building heights of four stories (40 to 45 feet) are desirable since freeway is 40 feet high.

The odd-shaped parcels at King and Seventh Streets caused by any I-280 freeway ramp solution could be used for wholesale uses like those in the adjacent Showplace Square.

2.13.4 Land Use Compatibility with R&D

[illegible]

R & D Compatibilities

These types of R&D uses vary by use characteristics and also by the degree to which they would be compatible with each other and other land uses. The range of R&D types extends from RD-1 which would resemble secondary office, to RD-5 which would be more like a heavier industrial land use. The RD-1 end of the range typically has less associated truck traffic and more building height, landscaping and public access. Conversely, RD-5 usually has associated truck traffic, and less landscaping and public access. The diagram summarizes R&D land use compatibilities. While they do not reflect absolute distinctions (since all R&D may use or discard hazardous materials that are not compatible with any use), they provide a common sense guide for R&D siting considerations.

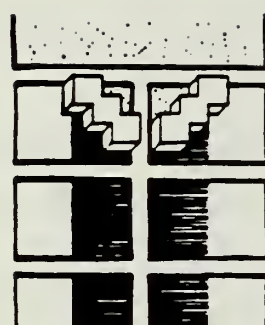
2.14 Community Facilities

2.14.1 General Location Concepts

Community facilities may be located in a mixed-use zone, combined with housing, commercial or office uses. They may also be located in an institutional zone, which restricts other uses. Some uses can be combined within a neighborhood center; others require separation. Community facilities can be located according to four basic concepts.

- o Transition Zone—Community facilities can be located in transitional zones, creating a focal point between major land uses.
- o Townsquare—In this concept, community facilities are located in a mixed-use zone, around a central plaza shared by several neighborhoods.
- o Mainstreet Corridor—In this case, community facilities are distributed along with a main commercial street

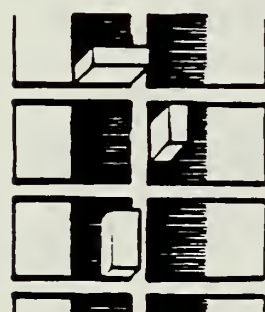
2.0 PLAN DETERMINANTS



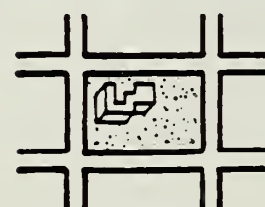
Transition Zone



Town Square



Main Street Corridor



Neighborhood Park

interspersed with other uses and would be very transit accessible.

- o Neighborhood Park—Community facilities can be decentralized, located in small parks serving about 1,500 households each. This is an especially appropriate arrangement for childcare facilities.

The plan may fix the location of specific community facilities, or leave the designation flexible. Detailed location criteria for each of the community services are shown on the following chart. Not all of the services for which information is provided below will necessarily be located on this site. Further analysis, focused on actual site-specific needs will be required.

2.14.2 Fire Station

The San Francisco Fire Department completed a Fire Station Location Project in 1984. The study used computer modeling techniques to analyze alternative site configurations for strategically locating fire suppression resources in the City. Based upon this study and other considerations, the San Francisco Fire Department is planning to close the station at Third and Bluxome. Equipment and personnel will be relocated to the presently-vacant station at 1300 Fourth Street which is in Mission Bay. The Department anticipates renovating and occupying the vacant building during the next three years. The Department, however, would consider transferring its needed facilities to a new location in Mission Bay.

2.14.2.1 Physical Components

The key concept in planning a firehouse is achieving the shortest turnout time possible. This requires grouping various functional spaces in an adjacency pattern so that movements to exit from the firehouse are minimized.

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2.14.2.2 Size

Building: 12,000 square feet. A single story is preferred, however, 2,000 to 3,000 square feet may be on an upper level.

Outdoor Training Area: 8,000 square feet.

Minimum lot size: 1300 Fourth Street site, about one-half acre.

2.14.2.3 Location Criteria

- o Primary service area within 1/2 mile radius.
- o Streets close to, and leading to major thoroughfares.
- o No topographic barriers within the primary service area.
- o Near high population density or commercial areas, away from low density residential.
- o Minimum building setback: 30 feet. Sixty (60) feet is preferable.
- o Located on most stable land for earthquake safety and to maximize ability to respond in emergencies.
- o Main arterial location to be at least 50 feet wide to accommodate hook and ladder truck.
- o Avoid low sun orientations at fire truck doors for swift and safe equipment exit.
- o Air rights should be considered in high density locations.

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Location Criteria for Community Facilities

	Fire	Police	Schools	Public Health	Public Safety	Child Care	Cultural Arts	Religious Facilities	Libraries	Multi-Service Community Center
1. Near Housing			●			●		●		●
2. Away From Housing	●	●								
3. Security/Noise Buffer Required	●	●								
4. Near Public Transit		●	●	●		●	●	●	●	●
5. Near Shared Parking							●	●		
6. Near Major Intersection								●		
7. Near Major Artery	●			●						
8. Two Street Access		●								
9. Not on Busy Highway	●	●				●				●
10. Away From Major Streets										
11. High Visibility		●					●			
12. High Imageability							●			
13. Near Commercial Areas	●								●	
14. Near Nighttime Amenities							●			
15. Air Rights Okay	●		●	●						
16. Central to Adjacent Communities	●	●			●					
17. Near Other Community Facilities			●	●	●	●			●	●
18. Decentralized						●		●		
19. Near Large Open Space			●				●			

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2.14.3 Police

The existing Southern Station, location in the Hall of Justice, is inadequate today. With the new 1,200 residential units planned for South Beach, and an anticipated large residential neighborhood in Mission Bay, a new location for the Southern Station will be required.

2.14.3.1 Physical Components

The Southern District Station would contain the following components: neighborhood-related services; district command facilities; district patrol administration and communication; suspect booking and detention; walk-in service and information; storage for police vehicles and equipment; briefing, locker and deployment center for police personnel; training, physical fitness and pistol range facilities; interview rooms; juvenile services; and center for police neighborhood interaction. The station would be open 24 hours.

2.14.3.2 Size

Building: 20,000 square feet, on one level preferably.

Site Size: One acre, less if combined with other facilities.

2.14.3.3 Locational Criteria

- o Should be centrally located to serve existing and emerging population centers at Mission Bay and South Beach. A location on either Brannan Street or Townsend Street would be ideal.
- o Could be located adjacent to or planned jointly with new fire station facilities.
- o Must have several avenues of access and egress; three is preferred.

2.0 PLAN DETERMINANTS

-
- o Preferably located on most stable land, so as to maximize earthquake safety and ability to respond in emergencies.
 - o Line of site to Twin Peaks Tower to maximize microwave transmission.
 - o Visible and accessible to the public. Not on a side street, or street with limited frontages.

2.14.4 Schools

The San Francisco Unified School District projects the need for a new Middle School in San Francisco by the year 1990. Population projections prepared by the School District suggest that the greatest demand for facilities by that year will be for grades 6, 7, and 8. Since 1980, the San Francisco school age population has been growing by 1.8 percent to 2 percent per year. Four sources of increased demand have been identified: (1) the San Francisco birthrate is up; (2) there is an influx of population from Southeast Asia living in the South of Market area; (3) Navy personnel stationed at Hunter's Point where at least one Battle Group will be stationed, increasing school enrollments by at least 600 children; and (4) additional demand for school facilities will be created by the project itself, depending upon project demographics.

2.14.4.1 Physical Components

The school site would include a gymnasium, cafeteria, school library, auditorium and approximately 32 classrooms. The school could be designed to be built in phases.

The school site could also accommodate a mass care facility, library, health care facility and/or child care facility on or near the four-acre site.

2.14.4.2 Size

The school would accommodate between 600 and 1,000 students, with a staff ratio of 1:20. The staff would therefore range between 30 and 50 people.

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Building: State funds allow 65 square feet per student. An additional square footage allowance is made for increased circulation needs, resulting from the need for multistory buildings. Seventy-eight (78) square feet per student is allowed for San Francisco schools which are typically two or three stories. The total square footage will therefore be 46,800 to 70,200 square feet.

Parking: Allow on-site parking for all personnel. 30 to 50 cars.

Site size: Four acres.

2.14.4.3 Location Requirements

- o Consider the soil conditions, geological requirements. Building on areas with liquifaction will result in greater costs and higher life safety risks.
- o Should be not more than one block from public transit.
- o Impacts from the freeway and major arterials should be minimized.
- o Public health, park, library, senior and childcare facilities could be a part of the school site.

2.14.5 Public Health

The Mission Bay project will result in increased demands on the facilities and services of the Department of Public Health.

As buildings are completed and occupied, there will be a need for health inspections of package good stores, restaurants and bars; increased population places demands on routine emergency services provided by the health department, such as paramedic/ambulance services. A major new residential and working population, will result in an increase in the alcohol and substance abuse caseload of the Department of Public Health.

2.0 PLAN DETERMINANTS

2.14.5.1 Physical Components

A multipurpose public health center could include the following services. Not all of these services must be on one site. Actual size is dependent upon site-specific needs.

- (1) Primary care, public health nurses, environmental health, health education, occupational health, toxics program, VD clinic, rodent control, emergency services, substance abuse, and mental health programs;
- (2) Forensic medical services, jail health services, and child abuse programs;
- (3) Board and care facilities to meet project needs as population grows older, plus current and projected proportion of citywide needs; and
- (4) Private primary care facilities.

2.14.5.2 Size

Multipurpose public health center: Assume a staff of 50.

Building: 20,000 square feet, two or three stories.

Site Size: 40,000 square feet. One acre.

2.14.5.3 Location Requirements

- o The multipurpose health center could be close to schools and daycare.
- o In the direction of major traffic flow from the development to the outside.
- o Public transit desirable.
- o Forensic medical services, jail health services and child abuse programs should be sited away from residential neighborhoods, possibly incorporated in police facilities.

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2.14.6 Public Health and Safety

The Mission Bay site has been identified as an area in which seismic hazards such as liquefaction and associated lurching and lateral spreading, may exist. The fill soils have been identified as having the highest potential for liquefaction.

Other potential hazards include rail traffic, car traffic corridors, possible toxic problems from future R&D, and dangers inherent in nearby port operations.

Because of the lay of the land, between freeway overpasses, and across bridges, in the case of a disaster such as a major earthquake, it is possible that Mission Bay will be cut off from health and mass care facilities in other parts of the City.

2.14.6.1 Physical Components

If appropriate, a mass care facility could be within Mission Bay. The mass care facility requires a kitchen, bathrooms, both large and small rooms, and open space. Traditionally, mass care facilities are located in schools. The Mission Bay project offers an excellent opportunity to plan for mass care along with a new school site.

2.14.6.2 Size

Uses existing school facilities.

2.14.6.3 Location Requirements

- o High pedestrian traffic.
- o Near transportation.

2.14.7 Childcare

The increase in the number of households with both parents working, as well as the rise in the number of households headed by single women or men, has resulted in an increase in the demand for childcare facilities. Mission Bay should incorporate provisions for childcare.

2.0 PLAN DETERMINANTS

2.14.7.1 Physical Components

Classrooms, nursery, and outdoor play areas, fenced in from other activities.

2.14.7.2 Size

For office, for a maximum of 4 million square feet of new development, according to the formula in the Downtown Plan, 40,000 square feet of childcare facilities should be provided. An additional 10,000 square feet would be required if a maximum of 2.6 million square feet of R&D were built. In residential areas, there are about 30 children of nursery school age per 1,000 population. For a maximum of 8,500 dwelling units, childcare facilities would be needed for about 500 children. At a total of 15 children per classroom, 30 classrooms will be needed, amounting approximately to an additional 30,000 square feet.

Site Requirement: 15,000 square feet to 20,000 square feet for each facility.

2.14.7.3 Location Requirements

- o Near an elementary school or community center.
- o Radius of area served 1/8 mile maximum, 1 to 2 blocks most desirable.
- o Can be part of office or community buildings.
- o Not on a heavily-trafficked street.

2.14.8 Cultural Arts Facilities

While the Yerba Buena Project will incorporate spaces for performing arts, there is still an unmet need for rehearsal space, and other facilities for performing artists in the Mission Bay area. This should not be a multipurpose facility shared with other recreation.

2.0 PLAN DETERMINANTS

2.14.8.1 Physical Components

Auditorium, stage and backstage including a minimum of two rehearsal rooms. Possibly a small art gallery.

2.14.8.2 Size

- o Building: 15,000 square feet.
- o Site Size: Minimum 1/2 to 2 acres.

2.14.8.3 Location Criteria

- o Near possible shared parking balancing daytime with evening use.
- o Near public transit.
- o Service access required for large sets.
- o Visible and imageable node.
- o Near nighttime amenities.

2.14.9 Churches

There has been a major growth of religious activity both in San Francisco and nationwide during the past decade. This phenomenon crosses economic as well as ethnic lines. In San Francisco, the school system has been bombarded with requests for the use of auditorium space for weekly religious observations. The Mission Bay planning process should consider appropriate locations for churches.

2.14.10 Libraries

With a large projected Mission Bay population, a branch public library should be considered.

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2.14.10.1 Physical Components

A branch library would consist of an adult section, a childrens' section, public meeting rooms. The meeting rooms can be used by any organization, contingent upon there not being a charge for attending the event. Arts programs can and do occur regularly at public libraries; the space can lend itself to the inclusion of a small gallery.

The need for a branch library is expected to emerge in approximately 10 years.

2.14.10.2 Size

Building: 7,500 to 10,000 square feet on one floor. Access to elderly and disabled must be insured.

Site Size: 0.25 acres.

2.14.10.3 Location Criteria

- o Commercial/retail center.
- o Good public transportation.
- o Not as an adjunct to a public park.

2.14.11 Multi-Purpose Community Center

A community center serving the residents of the Mission Bay neighborhood would incorporate the following activities:

- o Provide meeting/class space for community gatherings.
- o Provide a small theater offering space for non-professional production. This could be coordinated with senior or childcare programs or facilities.
- o Provide gymnasium space for exercise and after-school programs.

2.0 PLAN DETERMINANTS

-
- o Provide opportunities for after-school community programs.

The community center can be incorporated into a recreation and parks facility or with a variety of other community service facilities.

2.14.11.1 Physical Components

One main building serving the residential area. Room size should be flexible to accommodate both large and small gatherings.

2.14.11.2 Size

To be determined.

2.14.11.3 Location Requirements

- o Easily accessible to residential area.
- o Near library and school facilities.
- o Adjacent or incorporated into recreation and parks activities.
- o Adjacent or incorporated into recreation and parks activities.
- o Not on busy highway.
- o Adjacent to open space.

3.0 Land Use Program

3.0 LAND USE PROGRAM

3.1 Introduction

This chapter includes the proposed land use program range for Mission Bay. The land use program lists the mix of uses, such as housing and retail, office and open space, and the amounts of each use considered achievable within Mission Bay.

The analysis of the site has suggested broad program limitations. Anywhere between no acreage and up to 295 acres could theoretically be devoted to any land use. The feasibility and desirability of that full range for each use have been evaluated, to create a target range for the land use program. The program, coupled with site and market conditions, policies and planning principles, and analysis of public needs and concerns, provides the basis for alternative land use plans. Following this chapter are illustrative land use plans that depict plan solutions achieving the program range.

The ranges of uses set forth in the land use program acknowledge the Mayor's letter of October 16, 1984 to Southern Pacific Land Company. The program within that letter is understood to be for the present time the balance necessary between residential and commercial uses to ensure that revenue from the project is available to help subsidize infrastructure, community services, open space and affordable housing requirements. The range of land uses has not yet been evaluated from the standpoint of economics. Such information is now being developed, and will be considered in formulating the Mission Bay Plan.

The land use program is based upon the analysis set forth in this chapter. It includes land uses that will create a functional, economically-feasible and desirable development. Basic planning principles used to establish the Mission Bay program are the basis of the analysis below. They are followed by a description of each of the program components. The proposed land use program is then presented.

3.1.1 Planning Context

There are 295 acres within the Mission Bay site. Approximately 50 percent of this industrially zoned and

3.0 LAND USE PROGRAM

developed site is vacant or underutilized. This reflects changing economic conditions, especially the decline in industrial activity in San Francisco and in the rail activities that support it. Industries have been declining in San Francisco since World War II, which itself had reversed a similar decline. Declining industrial use within Mission Bay provides the City with a land resource. This resource can continue to provide employment opportunities as it has in the past, and begin to provide space to resolve other current and future needs associated with the City's growth.

First among these other needs is housing. Employment growth has outstripped housing growth for many years. Housing vacancy rates are very low, and costs very high. While not all portions of the site are desirable for housing, the creation of a new, diverse residential community must be a high priority in San Francisco. Housing is discussed further in the next section of this chapter, Program Characteristics.

The City must continue to adapt to changing economic conditions and promote a diverse employment base. Mission Bay has been part of the City's employment sector in the past, and should not totally relinquish that role. First, the major city growth sector for the past couple decades has been offices, primarily with the downtown. Recently, while corporate headquarters and primary office functions have remained downtown, back office or secondary office functions have begun to relocate to lower-rent suburban locations. This both disrupts the lives of San Franciscans who must then commute, and constrains the City economic base. Mission Bay provides an opportunity for the city to retain its share of this employment base. The second opportunity is research and development, a form of light industrial activity expected to be the Bay Area's major growth sector through 2000. The City needs to explore provisions for new technology to expand and diversify its employment base. Both back office and research and development provide a range of employment opportunities, including entry-level and lower-skilled jobs. These are described further under Program Characteristics.

Mission Bay is within the Central Waterfront area, and accommodation should be made for neighboring maritime uses

3.0 LAND USE PROGRAM

which warrant consideration in Port priority areas east of Third Street. Additionally, Port and regional agency plans proposing a container terminal east of Third Street are acknowledged in this work.

Within any development, there are associated needs for retail, services and community facilities. These can help define its character as well as serve the population.

The open space opportunities of Mission Bay are unique, due to the presence of China Basin Channel and the site's proximity to the Bay. Open space should both serve the new community and take full advantage for the City of the extensive site shoreline.

This provides a broad context for programming Mission Bay land uses; it reflects the need for a variety of land uses on the site, as Mission Bay is developed over the next 20 or more years. Mission Bay should be planned to accomplish a transition from older land uses to a mix of uses that would meet many of these current and future needs.

Mission Bay should be a balanced mixed-use development that (a) provides opportunities for a variety of land uses contributing to citywide needs; (b) responds to existing physical conditions on and near the site; (c) creates a new neighborhood and work place with associated amenities; and (d) creates enough commercial activity to support the infrastructure and other amenities necessary for the community as a whole. Each of these concepts is discussed further below:

- (a) The success of any major city depends in part on the diversity of the land uses and human activities that occur there. A healthy city includes housing, provides jobs, and offers amenities that enable citizens to conduct their lives and share social, cultural and recreational events. The development of a major new area the extent of Mission Bay should have the same range of activities, to give a more urban than suburban quality. New housing is more desirable and successful when convenient shopping and personal services are planned nearby and when residents can easily get to their work places. New employment centers benefit from the same provisions. A

3.0 LAND USE PROGRAM

mixed use community includes daytime, evening and weekend activities which support the broadest range of retail, service and cultural facilities. Such a community also calls for a variety of open space and recreational opportunities.

A mixed-use community would be able to meet the need for more housing to reduce pressures on the existing housing stock and accommodate more of those who wish to live within San Francisco. This includes new households formed by San Francisco residents, as well as people from other localities. Such a community can also help provide an economic base that reflects changing trends and is adaptive to growing economies when existing economies decline or find a competitive advantage elsewhere. The secondary office market and research and development activity are two areas which can benefit San Francisco.

Mission Bay is such a large area that a variety of uses can be properly provided. Moreover, it should not be a single-use site dependent on other surrounding areas for support. Rather, it can be a complete and dynamic urban area that contributes to the quality of life in the entire City.

- (b) The land use program must take into account the opportunities and constraints that the actual site and its surroundings present for development. Site conditions narrow the choices of appropriate uses, as some areas are better suited than others for specific land uses. For example, most of the center of the site is Bay Mud and fill, necessitating high construction costs for taller steel-frame housing or office buildings. This area is more suitable for lower-rise housing, in order to assure affordability and open space. Most of the site north of the China Basin Channel is geotechnically quite suitable for taller buildings, and particularly for office since nearby uses are office. Similarly, the area next to I-280 is more appropriate for research and development (R&D) uses than for housing or recreation/open space, because R&D can be designed to tolerate the I-280 noise levels

3.0 LAND USE PROGRAM

and lack of visual amenities. Land along Third Street, especially at ground level, seems unsuitable for housing frontages because of the high traffic volumes and noise along this major street.

For further analysis, please review the Land Use Opportunities Map (Figure 29) provided in the Background and Preliminary Findings Report for Mission Bay (November 8, 1985) which suggests where particular land uses are most appropriate. The map forms part of the basis for developing the Mission Bay land use program and illustrative plan alternatives in this report.

- (c) Ample acreage exists in Mission Bay to provide many new housing units in a configuration and at a scale that exemplifies denser neighborhoods. This site can have a significant amount of low- to mid-rise housing with safe and adequate access and circulation, with major open space amenities and with neighborhood commercial facilities nearby. The new neighborhood can include about 25 to 35 housing blocks with a prevailing pattern of residential building scale and streets rather than a super-block development. Neighborhood shopping streets similar to Clement Street can be a focus for the neighborhood. Also, community facilities can be located conveniently for residents.

Similarly, work places developed in Mission Bay can be designed comprehensively rather than on a piecemeal or block-by-block basis. Open spaces for individual buildings can be designed and linked to others to serve a broader community according to large-scale planning and broader urban design criteria. North of China Basin Channel, employment can be concentrated to generate sufficient demand to support daytime amenities such as restaurants, shops and noontime recreation or open space areas. These retail uses and public spaces can be enjoyed during both the day and evening by employees and residents.

- (d) Commercial uses provide the best opportunity at Mission Bay to generate revenues to finance infrastructure costs

3.0 LAND USE PROGRAM

and subsidize other uses. Achieving the right balance between revenue-producing uses such as back office and research and development activity, revenue neutral (or break-even) uses such as housing, and uses that require subsidy such as open space, community services and affordable housing, is critical to implementing a plan for Mission Bay.

3.2 Program Characteristics

To achieve the general criteria discussed above, a balanced mixed-use program for Mission Bay should include most if not all of the following land uses: housing, secondary office, research and development (R&D), neighborhood commercial, open space, community facilities, a hotel, discount retail and associated infrastructure. It should also acknowledge maritime activity.

Realistic amounts of each land use must be carefully combined to produce a buildable land use program. The appropriate amount of each land use is determined by its size requirements and relationships between that use and others (for example, residents and workers require retail and services uses).

Following is a discussion of the characteristics of each use and relationships between the various land uses that lead to the composition of a realistic land use program. This includes the constraints that limit the maximum and minimum acreage for each land use.

3.2.1 Housing

The greatest priority for land at Mission Bay is housing. The City has very low housing vacancy rates, and very high housing costs. Mission Bay is close to employment centers, thus minimizing the commute for its residents. Its climate is among the best in San Francisco, and the China Basin Channel and the Bay offer unique recreational opportunities.

Mission Bay Objectives and Policies (December 30, 1985) seek to "Increase substantially the City's supply of housing through development in Mission Bay." The desired housing program is

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further defined by Mission Bay policies calling for (a) a mix of housing sizes, tenure and types; (b) high housing densities; (c) housing affordable by a wide range of income groups; (d) housing for groups with special needs and/or lifestyles; (e) economic integration in housing; and (f) housing in residential neighborhoods of the character and quality of traditional San Francisco neighborhoods. When considered together, these qualifications for Mission Bay housing define the amount of housing that can be provided on the site. The maximum housing program is further constrained by site conditions, such as the extent of bay mud on the site, noise, recommended limitations on building heights and economic constraints to construction of housing.

All of these factors, along with the need for a balanced mixed-use development, dictate the recommended range of dwelling units and residential acreage for the Mission Bay program. To meet the aforementioned need for housing while respecting site conditions, a range for housing of 7,200 to 8,500 units on approximately 86 to 96 acres is proposed.

Increases above approximately 96 acres (or above 8,500 dwelling units), are constrained primarily by the goal not to exceed eight stories, construction costs associated with increasing housing densities, the desire to create a typical San Francisco residential neighborhood with open space to serve the population, the desire to diversify San Francisco's economy through development within Mission Bay, and the need to include commercial uses to produce sufficient revenue to cover infrastructure and other public benefit costs of the development.

Decreases in the minimum acreage below approximately 86 acres (about 7,200 dwelling units) are constrained by the Citywide demand for housing of varying types, the need for affordable housing, and the desire for a typical San Francisco neighborhood and a housing emphasis in Mission Bay development. Citywide demand for housing is considerable, especially if more job opportunities are created in Mission Bay. The need for affordable housing also dictates that certain economies of scale (numbers of new units) are achieved to minimize construction and project management costs. When

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large numbers of housing units are built, fewer costs are passed on to renters and home buyers. The number and density of housing units also must be of sufficient scale on the Mission Bay site to create an urban neighborhood. Lower densities will produce a very anomalous suburban development, not in keeping with the urban form of the City, or City land values.

The City's Office Affordable Housing Production Program (OAHPP) calls for housing to be constructed in conjunction with new office development (Ordinance No. 358-85, effective August 18, 1985). Housing units are required at a ratio of 38.6 units for each 100,000 net additional gross square feet of office space. Of those units, 62 percent must be affordable to low or moderate income households. The range of 7,200-8,500 units would provide much more housing than required by OAHPP even for the maximum office development that conceivably could be accomplished on site. A Mission Bay Policy (December 30, 1985) calls for integrating mixed-income units throughout the development.

3.2.2 Secondary Office, Research and Development and Maritime Uses

A variety of employment opportunities should be created at Mission Bay. Such uses as secondary or back office, and research and development, offer an opportunity to diversify the City's economic base and employment opportunities, and retain existing jobs. These commercial uses also have to provide revenue to subsidize infrastructure, open space, community services and affordable housing within Mission Bay. It is important, however, that secondary office and R&D space not be priced out of the market for such activities.

No other location in San Francisco is as logical for these functions, as Mission Bay is contiguous to the downtown area, little displacement is involved, excellent transit access can be developed, and vehicular and rail access is good. Maritime-related activity can be considered for areas of the site nearest existing Port uses. Retail uses (see Section 3.2.3) and therefore jobs also should be created as part of a balanced employment base and to support other uses.

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All these types of employment provide jobs for a range of income levels and for a variety of skill levels. Including these employment opportunities as part of the development adds to the vitality and activity within Mission Bay, and offers employment to its residents within easy walking distance of their homes. These uses also provide opportunities for affirmative action programs, which will be addressed in later phases of this work.

These uses and their suggested range for acreage are described in the following sections.

3.2.2.1 Secondary Office

Secondary or back office can complement existing primary office uses by providing a San Francisco option for local businesses considering relocation of some or all of their functions to suburban office parks. It can retain jobs for existing residents who would otherwise follow their jobs out of town or have to find another.

The range for acreage for office space has been defined by the following factors: site suitability analysis, the desire to complement not compete with downtown office uses, general market conditions and land values, the citywide demand for a variety of job opportunities, the need to ensure the viability of existing healthy economic activities, and the need to ensure an implementable plan for Mission Bay. That proposed range is 21-32 acres or approximately 3-4.5 million square feet.

Poor soils and height limitations on high-rise office construction, and the desire to provide office in support of downtown primary office uses, limit the appropriate acreage for office use at 32 acres. The central area of the site, shown as Bay Mud on Figure 23 in the Background and Preliminary Findings Report, is an unsuitable area for cost-effective construction of secondary office space. The cost of foundations and structure to stabilize tall buildings and ensure seismic safety is considerable.

Planning for less than 21 acres of secondary office (3 million square feet) does not conform with the need for office uses as

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a transition from South of Market to Mission Bay, the City's desire to compete more effectively with other Bay Area cities for secondary office space users, and the need for revenue-producing uses to subsidize infrastructure and other development within Mission Bay. Land values and site circulation proposals for major traffic and transit thoroughfares north of the China Basin Channel suggest office is the best use for most of that area of the site. The nearby South of Market area is predominantly light industrial and office uses, with a Townsend Street corridor designated for those uses, housing and nighttime entertainment (see South of Market Plan: A Proposal for Citizen Review, June 1985). The transition from this type of area into a new San Francisco neighborhood in Mission Bay must be made gradually through intervening land uses. Office use, which typically has fewer negative external impacts than industrial use and supports retail and open space amenities usable by Mission Bay residents, is an appropriate transition land use. Also, the major thoroughfare proposed in the King corridor both limit that area's suitability for housing, due to noise, air quality, and general impacts of high vehicular activity, and provide good access to and from workplaces located there.

The creation of office uses within the range suggested would provide between 11,000 and 16,700 new or "retained in the city" secondary office jobs over the next 20 to 30 years. These would be about 25 percent executives and managers, 5 percent technical and supervisory, and 70 percent clerical and support, as presently envisioned.

3.2.2.2 Research and Development

Research and development (R&D) activity warrants exploration as a new sector for the City's economy. It is expected to be the Bay Area's major growth industry through the year 2000. The City should, if possible, capture a share of that new technology-based employment, to diversify its economic base and work force. Declining economic sectors must be replaced to avoid job loss; Mission Bay, as a declining industrial area, should be renewed in a more competitive form.

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Research and development can include not only pure research and project development space, but also light manufacturing, warehousing and distribution functions. It also includes "bio-tech." Research laboratories within Mission Bay could expand the research base of existing medical institutions, and lead to product development. Flexibility is important as the opportunities may change over time.

The range of acreage required for R&D has been delimited by the R&D site suitability analysis (see Background and Preliminary Findings Report), the desire to capture a share of Bay Area R&D growth, market conditions, the desire to further diversify the City's economic base within this historically commercial area, and the need for a variety of job opportunities. The proposed R&D program range is 24-36 acres (about 2-4 million square feet).

Increasing R&D acreage to more than a maximum of approximately 36 acres (or four (4) million square feet) is constrained by uncertainty of the extent of market demand for such uses in San Francisco. The maximum may require increase, however, if a reduction in assumed floor area ratios is required for successful marketing, in competition with suburban locations that include open parking. Possible land use incompatibility with other proposed uses is also a constraint. Limited locations would be appropriate in Mission Bay because of proposed dense residential areas, since most R&D may use hazardous materials.

Decreasing the range to below 24 acres is constrained by the desire to maintain a diverse economy, the need for sufficient space to attract R&D, the need for land uses on the site that can serve as buffers next to I-280 and the railroad tracks, and the need for revenue-producing uses. R&D is typically clustered within industrial parks, and sufficient acreage must be allocated to attract this activity and provide a concentration of R&D within San Francisco. The R&D use serves another function as well: it can be placed next to I-280 as a buffer between both the freeway and railroad tracks, and Mission Bay housing. The creation of research and development uses within the range suggested would provide between 6,000 and 12,000 jobs over the next 20 to 30 years.

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These would be about 13 percent executives and managers, 10 percent engineers and technicians, 23 percent clerical and support, 40 percent production, and 14 percent other blue collar, as presently envisioned.

3.2.2.3 Maritime

The recommended range for maritime acreage is from zero (0) to fifty (50) acres. The minimum would suggest that all land east of Third Street within the Mission Bay boundaries ~~would be~~ used for non-maritime development. The maximum would suggest the opposite, that all this land ~~were~~ ^{would be} required for maritime use. this maximum is not essential to maintain existing maritime uses. It is assumed that existing bulk paper and coffee operations and ship repair at Piers 48 and 50 can be conducted on land presently used for those operations which is not in the Mission Bay planning area, thereby maintaining existing maritime.

If future regional market trends call for maritime expansion with containerization next to the Mission Bay site, all of the acreage east of Third Street would be required as back-up land. This would require substantial condemnation efforts to acquire privately-held portions of that land owned by Santa Fe Pacific Realty Company. Such a container terminal is called for in the Port's master plan, and the San Francisco Bay Area Seaport Plan of the Metropolitan Transportation Commission (MTC) and the Bay Conservation and Development Commission (BCDC). A decision as to whether that acreage will continue to be required for maritime use is not within the purview of this study. The program range maximum of 50 acres suggests that all of this land could be required for port-related maritime use. The Port has suggested investigation of an alternative container terminal location, in the area between its present facilities at Pier 70 and Pier 80 (see Section 2.8). This would provide the opportunity for a consolidation of Port container operations within one contiguous area. This study is underway.

The potential incompatibility of major port container terminal activities near a new neighborhood in Mission Bay should be recognized. Port container terminal activities in this location

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would (a) minimize residents' access to the Bay; (b) add truck traffic on Third; (c) pose visual obstacles (cranes); and (d) require site illumination during nighttime hours if double shifts are required. Providing no maritime acreage within the planning area results in no adjacent support land for existing maritime activities and precludes a container terminal; at a minimum, existing pier maritime use is expected to be maintained.

3.2.2.4 Relationships to Housing Demand

The ranges of office, research and development, and maritime uses expected to be within Mission Bay would result in a housing demand within San Francisco accommodated by the range of housing proposed. Clearly there is a favorable housing balance under the Office of Affordable Housing Production Program (OAHPP).

3.2.3 Retail

Retail uses should be provided to support residents and working persons in Mission Bay, add vitality within the area and provide employment. The programmed local-serving retail acreage range, from 5-12 acres, was identified based on the demand generated by residents and employees on the Mission Bay site and the opportunity for larger volume stores on site. Minimum neighborhood-serving and work place-serving retail demand may reach 300,000 square feet, or about seven (7) acres, some of which may be free-standing. The rest would be at the ground floor of other uses. This minimum is based on expected annual retail expenditures per household (assuming a maximum of 8,500 households) and annual expenditures per capita for workers in Mission Bay (assuming a high of about 29,000 new workers in all sectors). It assumes no discount retail will be located on the site. This retail use provides employment opportunities, for approximately 1,000 retail workers and further diversifies the employment base offered in Mission Bay.

The opportunity to provide acreage for discount retail on the site could produce the maximum retail acreage of 12 acres. Demand for discount retail is regional and based on prevailing

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general market conditions which suggest a demand for additional acreage for such a use. A possible doubling of the area currently used by such uses nearby would result in the need for an additional five (5) acres for 200,000 to 400,000 square feet (including on-site parking), of multi-story discount retail or about 700 to 1,700 jobs. Total retail square footage then would be 500,000 to 800,000 square feet and total retail job opportunities would be about 1,700 to 2,700. This use has the advantage of not generating peak hour commutes, and potential sharing of parking with office and R&D uses.

3.2.4 Open Space

Open space to meet the needs of Mission Bay residents and employed persons and for the general public should be provided in Mission Bay. Such open space must be subsidized either by the developer or provided by the City.

Department guidelines indicate that 4 to 5 acres of local and citywide open space should be provided for every 1,000 persons. About half (2.5 acres) should be provided within new developments to serve local residents. Active recreation facilities, such as play fields, should be included. If from 7,200 to 8,500 dwelling units (assuming 2.1 persons per dwelling unit) were built on this site, the guidelines would recommend provision of approximately 38 to 45 acres of open space.

Open space planned for office and R&D areas, 25 percent and 13 percent of such sites respectively, would require approximately 9 to 13 acres. Thus, local-serving residential, office and R&D open space ranges from 47 to 58 acres. The existing Channel area of 12 acres adds to this range. The desire to create a typical San Francisco neighborhood and a marketable project suggests additional open space to provide character and identify. This amount of open space, as well as any contribution of the development to open space needs elsewhere, cannot be quantified in the same fashion as the foregoing range.

There is also a desire to provide some unique open space amenity here for citywide residents and employed persons. The Recreation and Open Space Element of the Master Plan

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(1973) calls for nine acres of new public recreation areas along the Channel shoreline. Provision of a wetland habitat for the preservation and enhancement of tidal open space to support indigenous wildlife is under consideration. This would reflect the historical status of the Mission Bay site as a bay, bordered by marshes and the Mission Creek estuarine system. Fifteen to eighteen (15-18) acres is regarded as a minimum number of acres required to provide open space acreage, wildlife refuge areas and landscaping to foster wildlife use and some tidal open space for public education. Because of its regional resource value, if a wetland is appropriate, this acreage should be considered in addition to the basic Mission Bay-serving open space.

In order to provide substantial open space for Mission Bay, to benefit on-site residents and employed persons and all San Francisco citizens, especially those in areas like nearby South of Market which has very poor open space/household ratios (1 acre/1,088 dwelling units), sixty-seven to eighty (67-80) acres are recommended for local serving open space and 0-15 acres for region-serving open space. This range includes the Channel waters, as they will augment adjacent open space quality.

Increasing the acreage above a maximum of approximately 95 acres (80 plus 15 acres) is constrained by market conditions; the desire for an urban not suburban neighborhood; the desire to focus visitors seeking open space to certain public areas rather than draw them into the Mission Bay neighborhood; the desire to include substantial numbers of housing units and diversify the City's economic base; the need for revenue-producing uses to subsidize open space, infrastructure and other public benefits; and possible conflicts with other proposed land uses, notably maritime activities. Open space should complement not dominate other Mission Bay land uses. It should be primarily local-serving, in an amount and distribution that does not draw large volumes of visitors into the Mission Bay neighborhood area, except in designated perimeter public areas so that neighborhood quality can be preserved.

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Reducing open space acreage below the minimum proposed 67 local-serving acres is constrained by the need to meet city open space standards as discussed above, the desire to create a marketable neighborhood and workplace and the desire to provide exemplary open space opportunities of benefit to the City as a whole. Significant open space will contribute directly to the marketability and desirability of Mission Bay residences and workplaces and indirectly to the quality of life citywide.

3.2.5 Community Facilities

Certain community facilities and services should be provided for residents and workers in Mission Bay to ensure life safety and the general welfare and create opportunities for social and cultural events. Such facilities must be either subsidized by the developer or provided by the City. In many instances, these facilities, while desirable for future residents and employees of Mission Bay, do not add to the marketability of the development and its ultimate feasibility.

Basic services, including fire and police, may require one acre at some location in the Mission Bay site. This acreage is derived from Fire and Police Department plans and operational standards and concerns that Mission Bay could become isolated in a major earthquake and therefore needs to be self-sufficient. Allocation of specific acreage for fire and police stations will be made at a later date.

A middle school (grades 6, 7 and 8) site of approximately four acres may be required in San Francisco. This need is derived from estimated Citywide educational needs, based on population increases. The population increase anticipated at Mission Bay suggests that the site or its vicinity is an appropriate location. Acreage above 5 acres exceeds the area needed for a school and acreage less than 3 acres is insufficient for a school site.

Public health, childcare, cultural arts, and a branch library are also considered as possible elements of the land use program for Mission Bay. These community services and facilities can be combined in mixed-use facilities, in probably more than one

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location. Thus, the possible 300,000 square feet for such uses can be considered as part of other land use allocations. If however such facilities were located in one four-story building, two acres would be required. The actual desired location of these various uses within the project site will dictate more precise acreage requirements and arrangements.

The resulting total acreage for free-standing community facilities including a school would be 6 acres. Increasing the maximum acreage above 6 acres is constrained primarily by competing demand for land. Decreasing the acreage to below about 2.0 acres is constrained by community need for basic facilities.

3.2.6 Hotel

A hotel should be considered as a possible component of the Mission Bay program. It complements both office and residential uses by providing necessary and convenient lodging as well as gathering places for businesses and for residents. It supports retail and services. The range of acreage for a hotel, 0-4 acres, is defined by competing demands for land and typical sizes of hotels in comparable settings. An increase in hotel acreage beyond 4 acres does not appear necessary in this area. If a hotel is included, at least two acres are required. A hotel would provide revenue to support other aspects of the project, without the disadvantage of requiring peak hour commuting of employees.

3.2.7 Infrastructure and Unusable Land

Infrastructure includes all circulation and utility rights-of-way or sites required for a functioning Mission Bay development. (Acreage for open space, sometimes grouped with infrastructure, has been considered independently in this program.) Acreage and funds are required for the following uses, often to be provided in joint rights-of-way, trenches or corridors: transit, vehicular, bicycle and pedestrian routes; gas, electrical, water, sewer, storm drainage, telephone and cable services; and any necessary utility or roadway work places. Unusable areas include areas under or next to freeways or freeway ramps and railroad tracks. Infrastructure costs of

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developing Mission Bay also include removing the I-280 Freeway ramps and structure between 3rd and 6th Streets, replacing the ramps, and any alterations to the Caltrain.

Acreage for these uses has been estimated based on assumptions about the standard width of various roadways, standard criteria for utility easements and an evaluation of the suitability of land for development in Mission Bay. Certain areas appear to be unusable although most of the site is developable. Infrastructure should be provided for that buildable area.

Both increases and decreases in the estimated acreage for infrastructure and unusable land will probably occur at a later date and will be based on a more specific land use plan. At present, the estimated acreage of 55 to 60 acres conforms to industry standards for such uses.

3.2.8 Summary: Proposed Land Use Program

Overall, the Department seeks to provide a healthy San Francisco living and working environment in Mission Bay. To do so requires a balance of various land uses which are compatible with each other on the 295-acre Mission Bay site. The mixed-use program outlined below is intended to provide essential land uses that serve residents and workers in Mission Bay and that contribute to the City's well-being.

The following recommended land use program is comprised of a list of the most appropriate land uses for Mission Bay with associated ranges of acreage for each.

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Table 1: Mission Bay Land Use Program

<u>Use</u>	<u>Acres</u>
Housing	86 - 96 acres (7,200 - 8,500 dwelling units)
Office	21 - 32 acres (3 - 4.5 million square feet)
R&D	24 - 36 acres (2 - 4 million square feet)
Maritime	0 - 50 acres
Retail	5 - 12 acres (300,000 - 600,000 square feet)
Public Open Space*	67 - 95 acres
Community Facilities	2 - 6 acres
Hotel	0 - 4 acres
Infrastructure and Unusable Land	55 - 60 acres
TOTALS	230 - 354 acres

* Includes public open space within housing, office and R&D acreage.

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This land use program provides realistic ranges for each land use appropriate for Mission Bay. Notice that planning for the minimum of each range would require a 230-acre site and planning for the maximum would require a 354-acre site. Maximum acceptable acreage for all uses cannot be achieved on this 295 acre site and some compromises or tradeoffs must be made. In the following chapter, three illustrative plans show how the programmed uses can be arrayed on the land. A land account for each plan indicates how much acreage of each use could be achieved.

4.0 Illustrative Plans

4.0 ILLUSTRATIVE PLANS

4.1 Introduction and Overview

In this chapter, three illustrative plans, or concepts, that array proposed land uses on the site are provided. As the discussions of Plan Determinants (2.0) and Land Use Program (3.0) show, there are many variables to be considered in the formulation of any plan for the Mission Bay site. No particular plan can totally optimize every determinant and every land use element. The finite land area and physical constraints will not permit a perfect plan that would meet all of the goals of every interested group, all the Mission Bay objectives and policies or all of the program elements. Each alternative plan represents trade-offs between competing uses and design concepts. For example, a plan that would maximize housing cannot provide maximums of other uses too. In order to illustrate the choices that exist for Mission Bay and show the effect of various trade-offs and configurations, three illustrative plans are described herein. Each one is based on an overall design concept and at least meets the minimum programmed land uses set forth in Chapter 3.0 in different ways. Each one also meets as many objectives and policies as possible.

The purpose of this chapter is to generate discussion about the trade-offs between design configurations and between uses. Decisions about the many trade-offs will lead to development of a Mission Bay Plan in which all aspects of the plans are greatly refined. It is possible to create a buildable and desirable Mission Bay community, the question is how best to do so.

There are areas of commonality among the illustrative plans. All plans show that the China Basin Channel is expanded, avoiding the significant cost of relocating major box culverts under Berry and Channel Streets. The Third and Fourth Street Bridges are consistently retained. All plans assume that the existing I-280 Fourth Street ramp will be removed, at least back to Sixth Street. North of the Channel, a major transit corridor is planned in each concept, linking Caltrain and Muni Metro and providing key transit stops. For all plans, extensions of transit lines off this corridor will serve the area of the site south of the Channel. It is assumed Muni bus or trolley service will be provided on major arterials throughout the site. For

4.0 ILLUSTRATIVE PLANS

each plan a new bridge to serve the western portion of the site is extended over the Channel between Owens Street and Sixth Street, and a major street follows an Owens Street alignment south of the Channel. All concepts assume building heights will not exceed eight stories to minimize view blockage from Potrero Hill. The existing houseboat community is retained in each concept.

Certain elements of the plans may be interchangeable. Three alternative solutions for new I-280 ramps are shown at the northwest corner of the site. Each reflects different opportunities and costs. Three new wildlife areas are shown. All are on the Channel. One is east of Third Street, one extends from east of Third to Fourth Street and the third is located between Fourth and Sixth Streets in the Channel. The first two would allow the establishment of a significant wetland habitat, the third would provide an improved but limited wildlife environment only. Except for these common elements, the concepts are distinct alternatives that should be evaluated individually.

~~As would be the case~~ For each alternative, ~~shown in this section,~~ if the proposed Port container terminal is developed alongside this site, all of the land east of Third Street would be required for Port operations. In addition, plan revisions would be required for all alternatives in the area immediately west of Third Street. Alternative C includes such a revision as a variant. A diagrammatic buffer is shown with Concept C (Section 4.4) to suggest that office, R&D and/or retail uses should be developed there rather than housing if Port plans are implemented, and open space would not connect south through the site to the Bay.

Each of the three concepts is accompanied by an illustrative plan of the open space system generally based on the land use plan and a descriptive statement on the advantages and disadvantages of the concept. Also included are generic sections through various open space elements and discussion of possible open space alternatives.

4.0 ILLUSTRATIVE PLANS

4.2 Illustrative Plan A

4.2.1 General Characteristics

This illustrative plan takes its general pattern from the extension of the South of Market street grid. The result is a continuous block pattern from Market Street to Sixteenth Street, with the China Basin Channel conforming to the street orientation. Along with open space improvements on both sides of the Channel, a central spine for open space is extended into the heart of the site perpendicular to the Channel. The land uses shape and define this open space. This spine would provide a central public amenity for residences on both sides of it. Another dominant feature is the extension of Fourth Street to China Basin Channel directing major traffic volumes to the perimeter of a predominantly residential neighborhood.

4.2.2 Land Use

Secondary offices and higher density housing is shown north of the Channel, both as a transition from nearby South of Market light industrial uses and as an appropriate use of some of the most stable ground for taller buildings on the site. It is desirable to provide for the major open space amenities suggested by the Channel for the largest aggregations of Mission Bay daytime and residential populations expected there.

South of the Channel would be primarily lower-density residential, creating a fairly typical San Francisco neighborhood, which exhibits orientation of residential blocks to the streets and open space, a central neighborhood commercial street and intermittent small parks. The recognizable character of the Mission Bay neighborhood could be readily established with first phase housing along the Channel. An open space waterway could be provided through the center of this neighborhood that could flow to an outlet at the Bay's edge. It would offer a central recreation/enjoyment area for the community. No other San Francisco neighborhood has yet taken such advantage of its proximity to the Bay.

CONCEPT A - Land Use

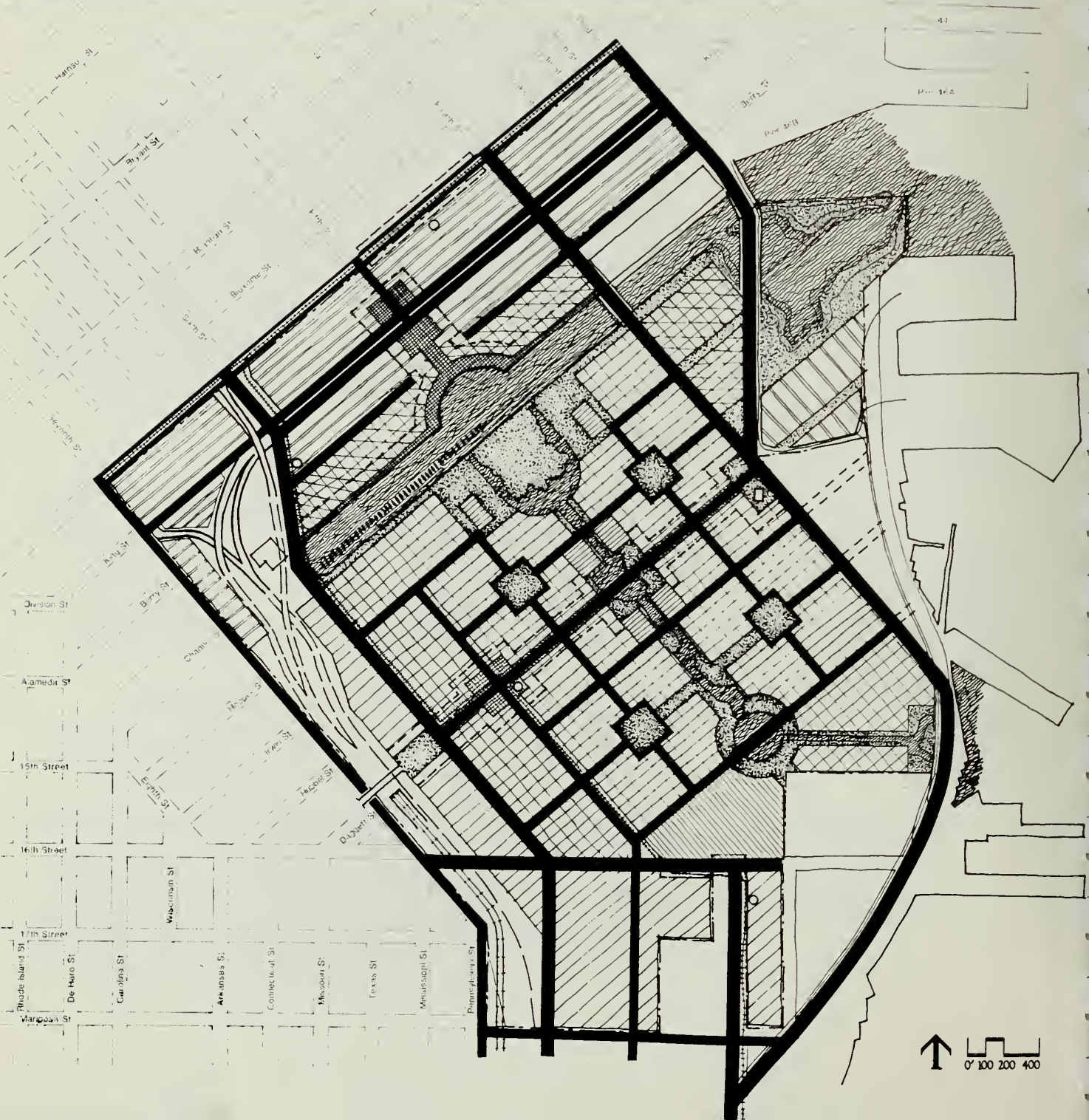
-  Open Space
-  Lower Density Housing
-  Higher Density Housing
-  Neighborhood Retail
-  Discount Retail
-  Secondary Office
-  Research & Development
-  Maritime
-  Muni Metro/Stop
-  Caltrain Station

Mission Bay San Francisco

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KwanHenmi Architects
Carl Anthony & Associates
Robert L. Harrison
Philip Williams & Associates
McGuire & Company

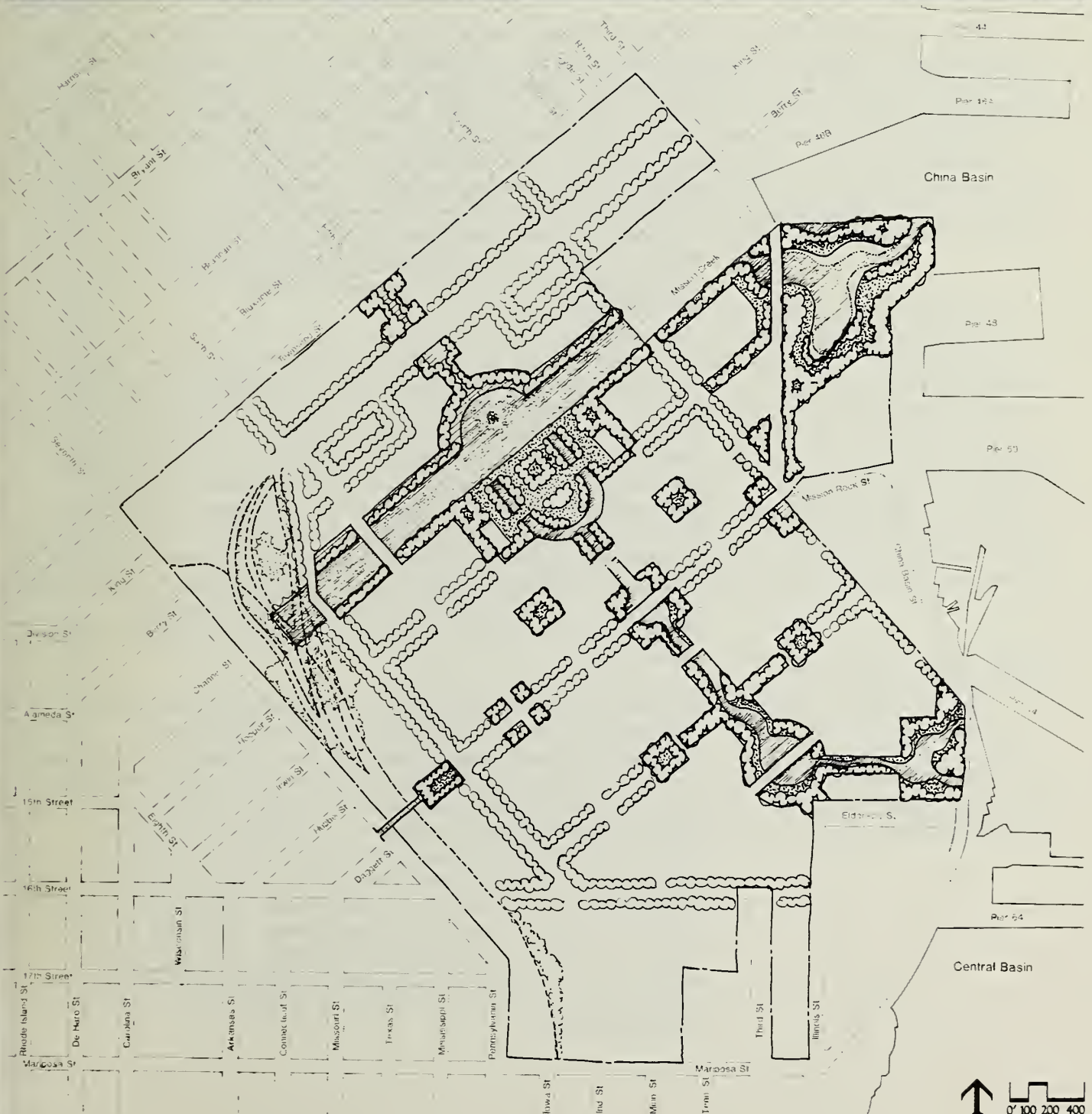


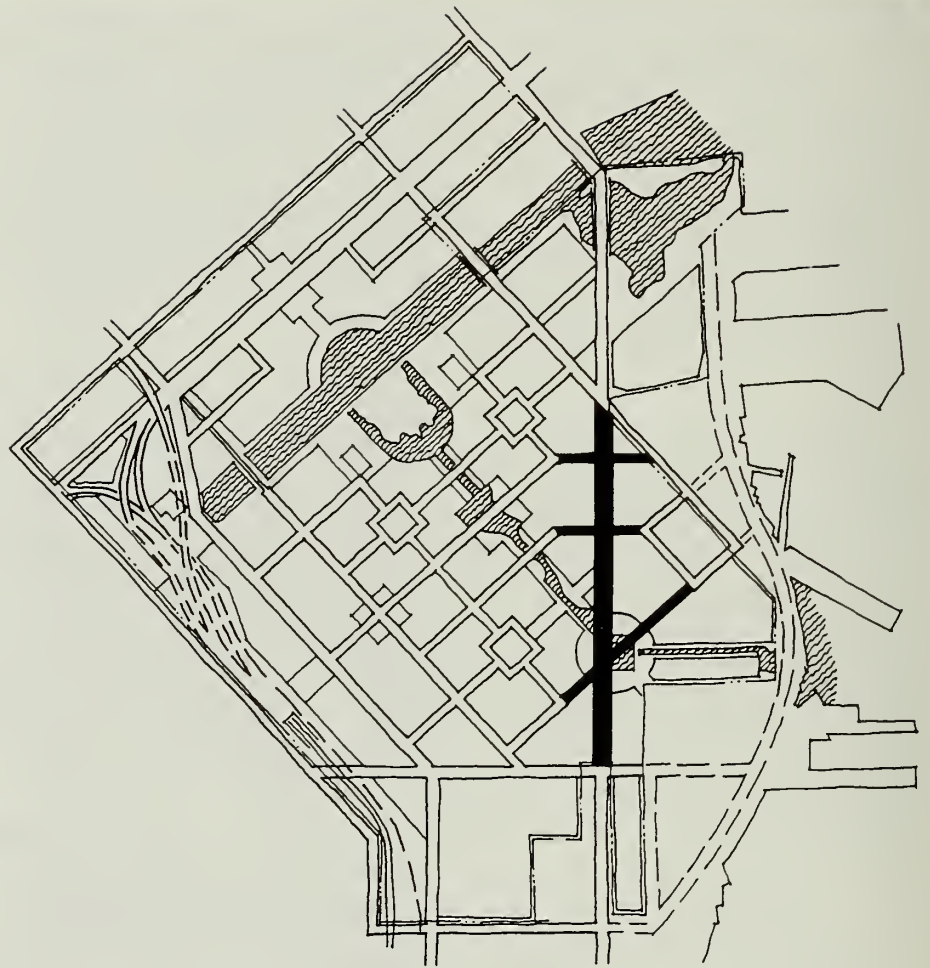
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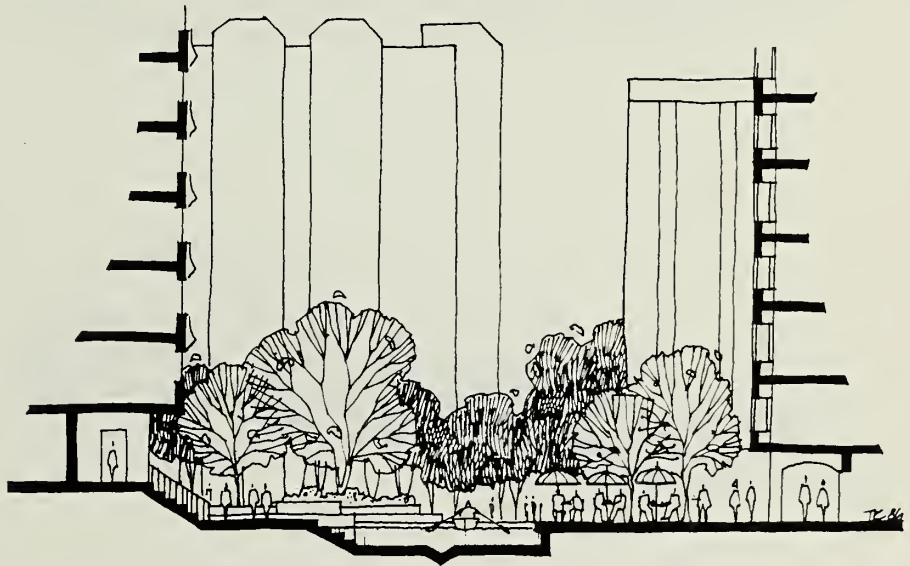


Concept A with Third Street

4.0 ILLUSTRATIVE PLANS

4.2.3 Open Space

The formal central spine using an extended Fifth Street axis would be the primary internal orienting element of this open space system. A non-tidal canal feature could meander through the spine, in a formal or informal pattern, with community facilities, neighborhood retail and residential uses, plazas and plantings supporting its path edges.



4.0 ILLUSTRATIVE PLANS

Midway along its length, the pedestrian spine could be crossed by a tree-lined shopping street extending from public open space squares at Owens Street and Third Street. The four main residential quadrants resulting from the grid pattern, the central spine and shopping street would each contain a major park block to create an association of the residential units with open space amenities. Pedestrian circulation throughout the project would largely utilize the central spine and sidewalks to interconnect all the parts of the development, including access to Potrero Hill, and any future waterfront development, with occasional greenways projecting off the central spine.



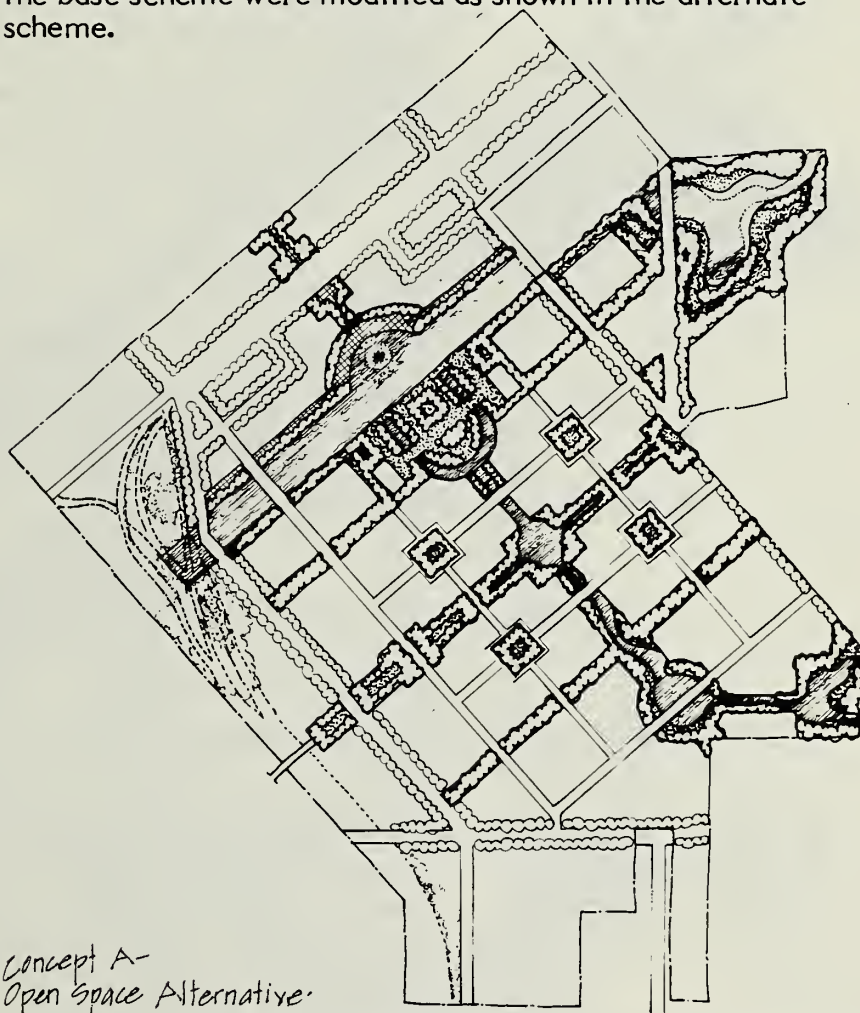
4.0 ILLUSTRATIVE PLANS

The junction of the central spine with the China Basin Channel is a major focal point of the open space system for areas both north and south of the Channel. A formal arrangement of significant buildings and open space features on the southern bank, including possible water falls which drop from the central canal into the Channel, would reflect the impressive high-density residential and grade-level retail complex on the northern bank. A possible water spire near the north side of the Channel could serve as a centerpiece to the Mission Creek open space and a destination point for travelers or viewers in South of Market. The formality of this concept suggests the need for strong architecture along the channel on both sides.



4.0 ILLUSTRATIVE PLANS

The open space could become a more interconnected system if the base scheme were modified as shown in the alternate scheme.



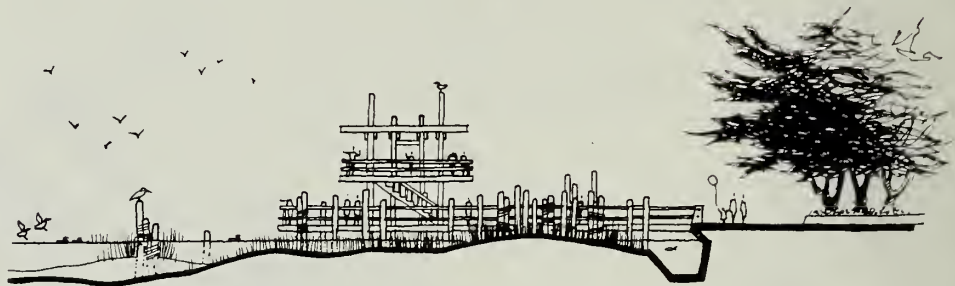
Concept A -
Open Space Alternative.

By adding three main pedestrian corridors, perpendicular to the central spine and adjusting the location of the four park blocks, the scheme can enable all the housing blocks to front onto open space amenities while creating major pedestrian linkages throughout. A larger network would therefore be accomplished with the elimination of some streets and minimal reduction in land use efficiency.

4.0 ILLUSTRATIVE PLANS



A wetlands habitat, play fields, secondary office or maritime uses could be located on the parcel northeast of Third Street. Studies to date show this to be the most favorable location for the habitat. It serves as a significant identifying feature at the mouth of China Basin Channel, would be less impacted by new development and affords a valuable recreational and educational resource for the greater San Francisco community.



4.3 Illustrative Plan B

4.3.1 General Characteristics

This concept takes its basic pattern from existing Third and Sixteenth Streets, offering a grid orientation south of the Channel roughly the same as that of Potrero Hill. North of the Channel, the South of Market grid could be retained. This concept features a large crescent open space, reminiscent of the shape of the historic Mission Bay which formerly occupied this site. The crescent is formed by the Channel and an open space waterway extending south parallel to I-280 or Sixth Street and arching up to an outlet at the Bay's edge. No other San Francisco neighborhood integrates Bay water systems so thoroughly.

4.3.2 Land Use

Land use north of the Channel could consist of secondary offices between Townsend and King Streets and higher density

CONCEPT B - Land Use

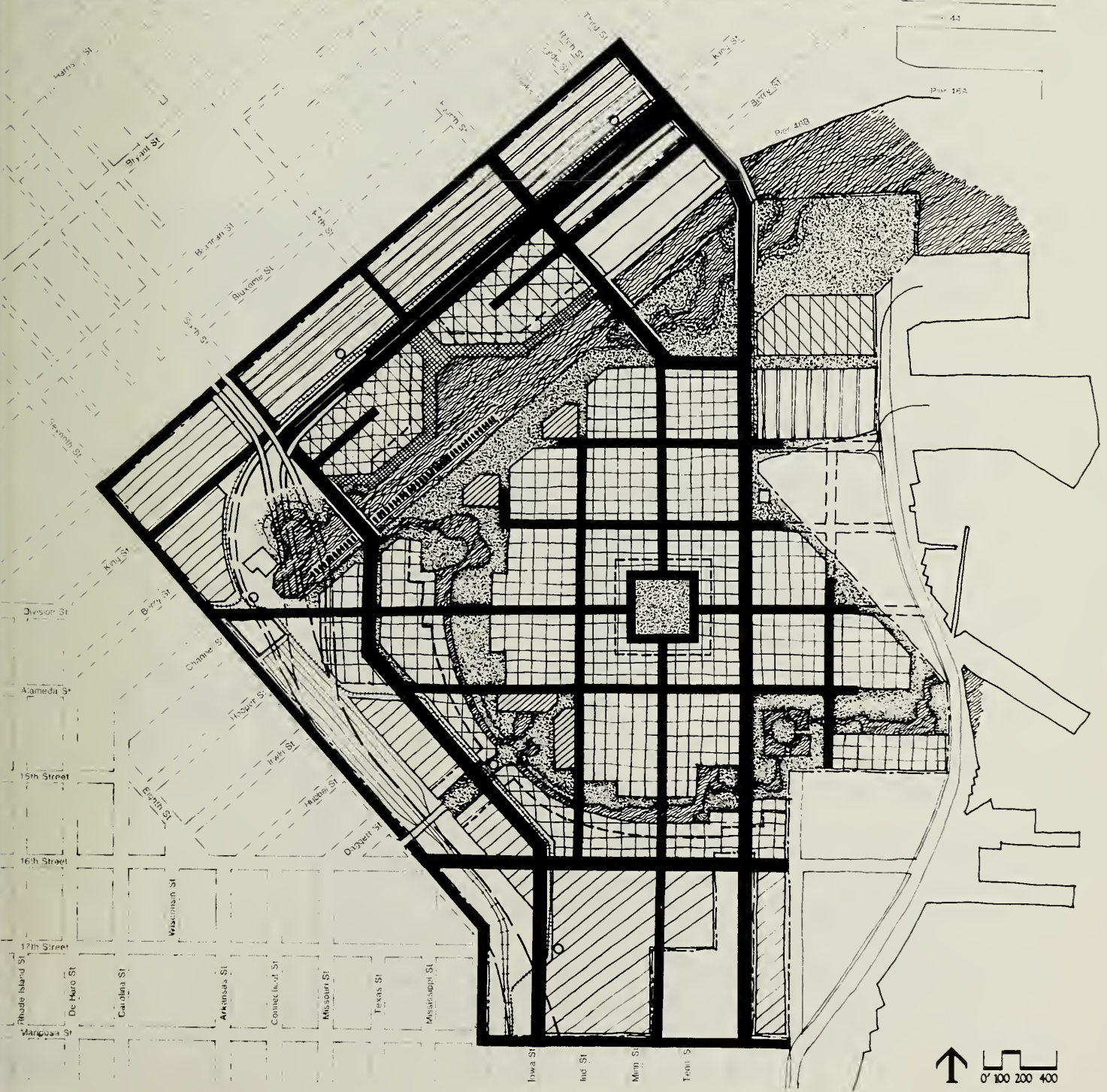
-  Open Space
-  Lower Density Housing
-  Higher Density Housing
-  Neighborhood Retail
-  School
-  Secondary Office
-  Research & Development
-  Maritime
-  Muni Metro/stop

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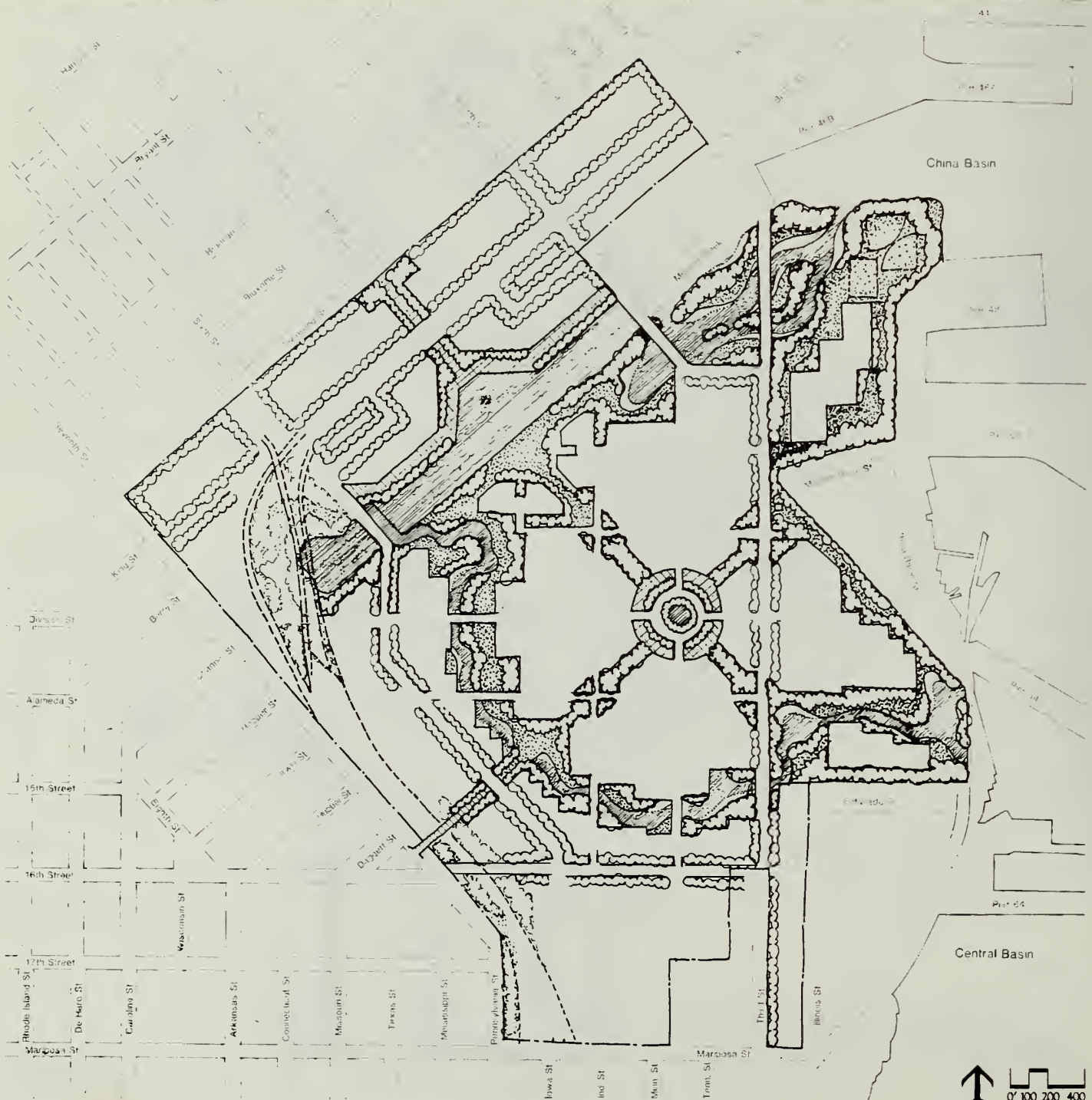


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4.0 ILLUSTRATIVE PLANS

housing next to the Channel. A substantial number of Mission Bay residents could easily enjoy and use the Channel. The more physically stable land north of the Channel suggests use of this site for more intensive development.

The lower density residential development, with associated community facilities, would begin south of the Channel. At an angle to the Channel some streets, similar to some of the Marina district streets, would reach the Channel, providing some residential frontages and view corridors. A neighborhood with a central open space and neighborhood commercial node would be planned west of Third Street. Additional lower rise residential blocks continue east of Third Street taking advantage of waterway and Bay proximity. Community facilities would be planned along the Channel near residences.

Views from the neighborhood streets would be north toward Downtown or east toward the Bay. This grid and neighborhood pattern also would emphasize the very long view east along Sixteenth Street, toward Twin Peaks, and it suggests a secondary retail street along Sixteenth serving Mission Bay and Potrero Hill. It also would result in north-facing units.

Along I-280, R&D uses on fairly small parcels would buffer the neighborhood, and be oriented inward toward the open space crescent. Retail uses could be developed along the open space crescent, providing a pedestrian-oriented shopping area serving these homes and the central neighborhood.

South of Sixteenth Street is planned for R&D uses, creating the opportunity for campus-like development as a transition from Mission Bay residences to industry and housing to the south.

Land east of Third Street at the Channel could be developed in part as a wetland habitat, in combination with the area nearby between Third and Fourth Streets. With this configuration of a wetland many travelers along Third and Fourth Streets would enter Mission Bay at a unique entrance, and observe the wetland but move through it without directly disturbing it. A wetland in this configuration forms the beginning of the open space crescent that encircles the entire site. This location could also be well-used for maritime-related uses, in

4.0 ILLUSTRATIVE PLANS

connection with activities on nearby piers. The parcel south of the Channel and bounded by Third and Fourth Streets would be an excellent location for a hotel which could take advantage of this shoreline site providing a unique lodging experience for San Francisco visitors.

This overall grid pattern would most directly link Mission Bay with neighborhoods to the south by retaining Third Street as a direct traffic and visual corridor toward Downtown. Also, although Sixteenth Street is the only actual link, this plan could reiterate the Potrero Hill grid suggesting kinship with that nearby neighborhood. The concept would call for direct connection with Showplace Square, along an extension of Division Street.

By altering the South of Market grid at the Channel, Mission Bay would be made visually different from that area. That distinction would be reinforced by the protective crescent encircling the residential heart of the site. Thus, the crescent could serve as a major amenity for the site and its surroundings, while distinguishing Mission Bay from those surroundings. There is, however, an opportunity to subtly reinforce an association with South of Market, using the axial open space suggested on the Open Space concept. While this concept provides more open space, efficient housing typologies described in Section 2.10 cannot be planned on the affected central blocks.

no page 4-15

4.0 ILLUSTRATIVE PLANS

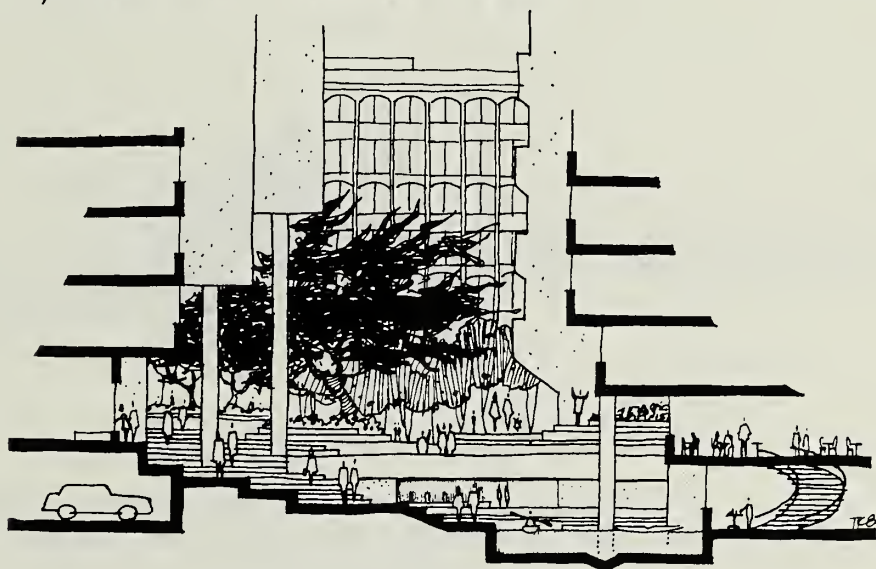
4.3.3 Open Space

Two main open space organizing forms would be used in this concept: (1) a large crescent embracing the community and (2) a pedestrian cruciform pattern focusing on a circular central plaza at the heart of the development. The crescent open space would be defined by a variegated saw-toothed pattern created by the adjacent buildings. Meandering through this canyon-like area, a non-tidal water feature would integrate the adjacent residential, retail and community uses with natural and recreational amenities.



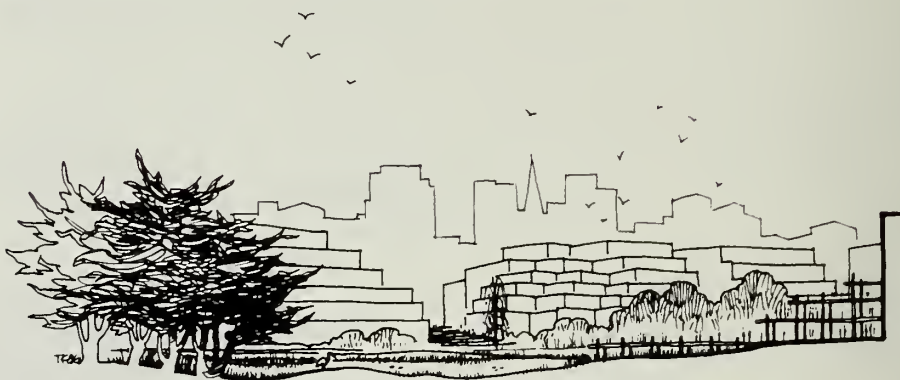
4.0 ILLUSTRATIVE PLANS

Originating with Bay water near the southern part of Mission Bay, the canal would thread through the crescent providing maximum amount of water and open space frontage to the community and a nearly traffic-free pedestrian spine from the Bay waterfront to China Basin Channel.



4.0 ILLUSTRATIVE PLANS

Approaching the Channel, the canyon would open to reveal vistas across to the north side and beyond to the Downtown skyline.

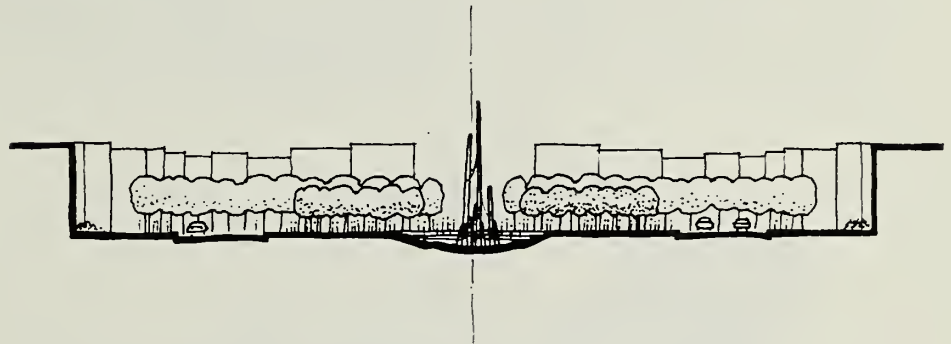


The canal could culminate at the Channel in a water feature which would fall from the new Sixth Street bridge over China Basin Channel.



4.0 ILLUSTRATIVE PLANS

The cruciform of pedestrian corridors centers on a formal grand circle and a possible public plaza. Its arms reach out connecting to the crescent and Potrero Hill to the west, the Bay waterfront to the south and east, and north to China Basin Channel.



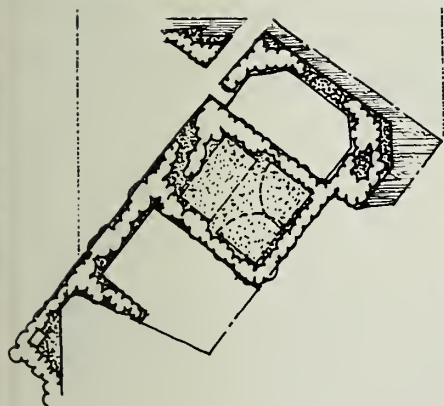
This open space concept functions as a complete interconnected network. All housing blocks would have direct visual and physical access to open space amenities. The system would be diverse in its form, scale and use patterns. A high degree of separation could exist between pedestrian and vehicular circulation networks. The system would facilitate easy pedestrian movement between all open space features. This concept would also afford the most extensive distribution of open space amenity throughout the community.

4.0 ILLUSTRATIVE PLANS

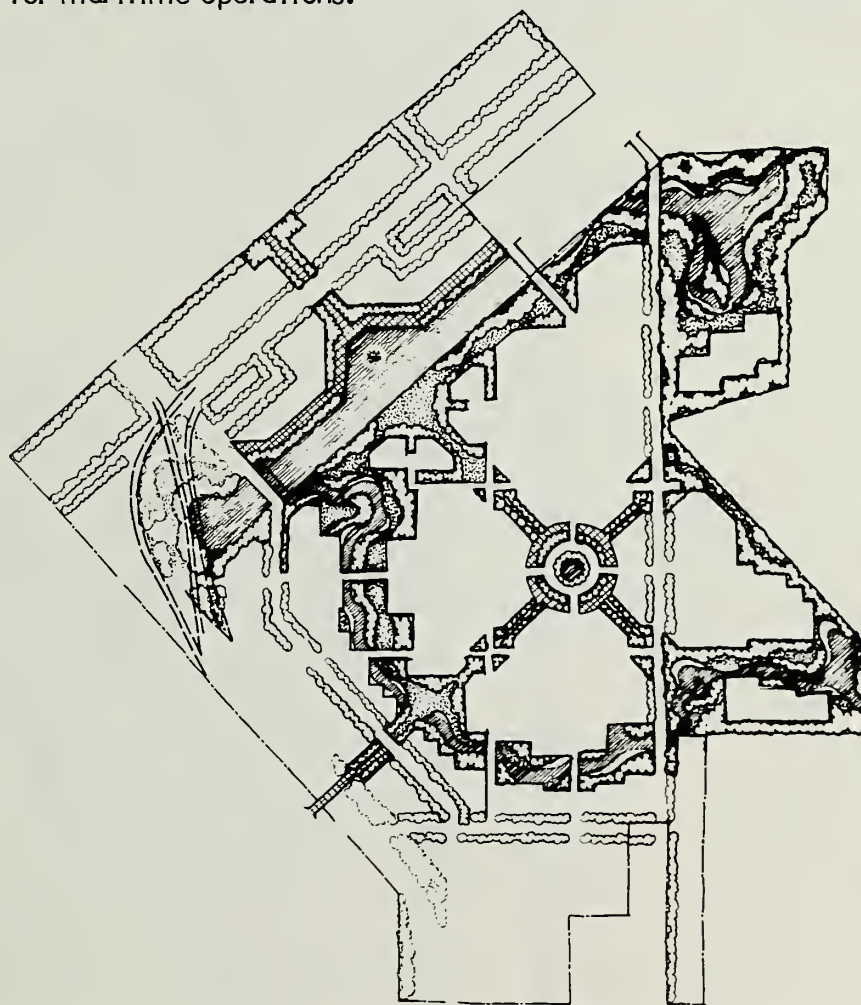
Because the open space scheme along the crescent does not adhere to the grid pattern of the adjacent streets and buildings, a variety of building shapes occur where the street grid meets the open space network. This would pose both disadvantages and advantages inherent in the design of residential housing units which front onto it. It is a less efficient housing layout, however it provides opportunity for much more interest and variation in the architectural configuration.



4.0 ILLUSTRATIVE PLANS



A marsh wetlands habitat could be integrated along China Basin Channel between Third and Fourth Streets and east of Third. This minimizes utility relocation expenses in the Channel while affording the benefits of the wetlands park to the community. It could be a dramatic gateway for Mission Bay as well as a recreational and educational resource. Further, this system would allow the opportunity for structured active recreation uses east of Third Street in addition to space for maritime operations.



Concept B - Open Space Alternative

4.0 ILLUSTRATIVE PLANS

As an alternate scheme, the marsh habitat could be situated almost entirely east of Third Street with maritime uses, eliminating the play fields area. A further option shows the building uses replaced by the play fields.

4.4 Illustrative Plan C

4.4.1 General Characteristics

This illustrative plan absorbs the several street patterns from the edges of the site to create a mixed grid on the site. The concept would adopt the South of Market grid at the western end of the Channel where the new Sixth Street bridge is needed. It would also incorporate existing Third Street, and parallel streets to the east. The intersection of the grids near the center of the site can then be resolved either with open space or curvilinear streets, or both.

4.4.2 Land Use

As Columbus Avenue or Market Street illustrate, the intersection of non-parallel grids creates both an opportunity for exciting urban places and a difficult transition from functional and economic standpoints. The earlier Southern Pacific Land Development Company plan (date) for this site provided one means of integrating the several grids with an island. Mission Creek Conservancy and San Francisco Tomorrow concepts suggested a major open space, the former emphasizing wetlands, and the latter a green park space. Another solution is suggested by this concept. Significant open space amenities would originate at the Channel and move south through the center of the site, then continuing eastward to the Bay. Multiple, variously-shaped open space areas could be created at the grid intersections. The central open space would become the focus of views from neighborhood streets since visual corridors no longer extend toward Downtown or the Bay. Except for Third Street, these corridors are eliminated by the foreshortened grids, creating an inward-focussed development. A retail street crossing this open space would give residents another neighborhood focal point.

CONCEPT C - Land Use

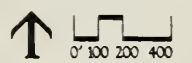
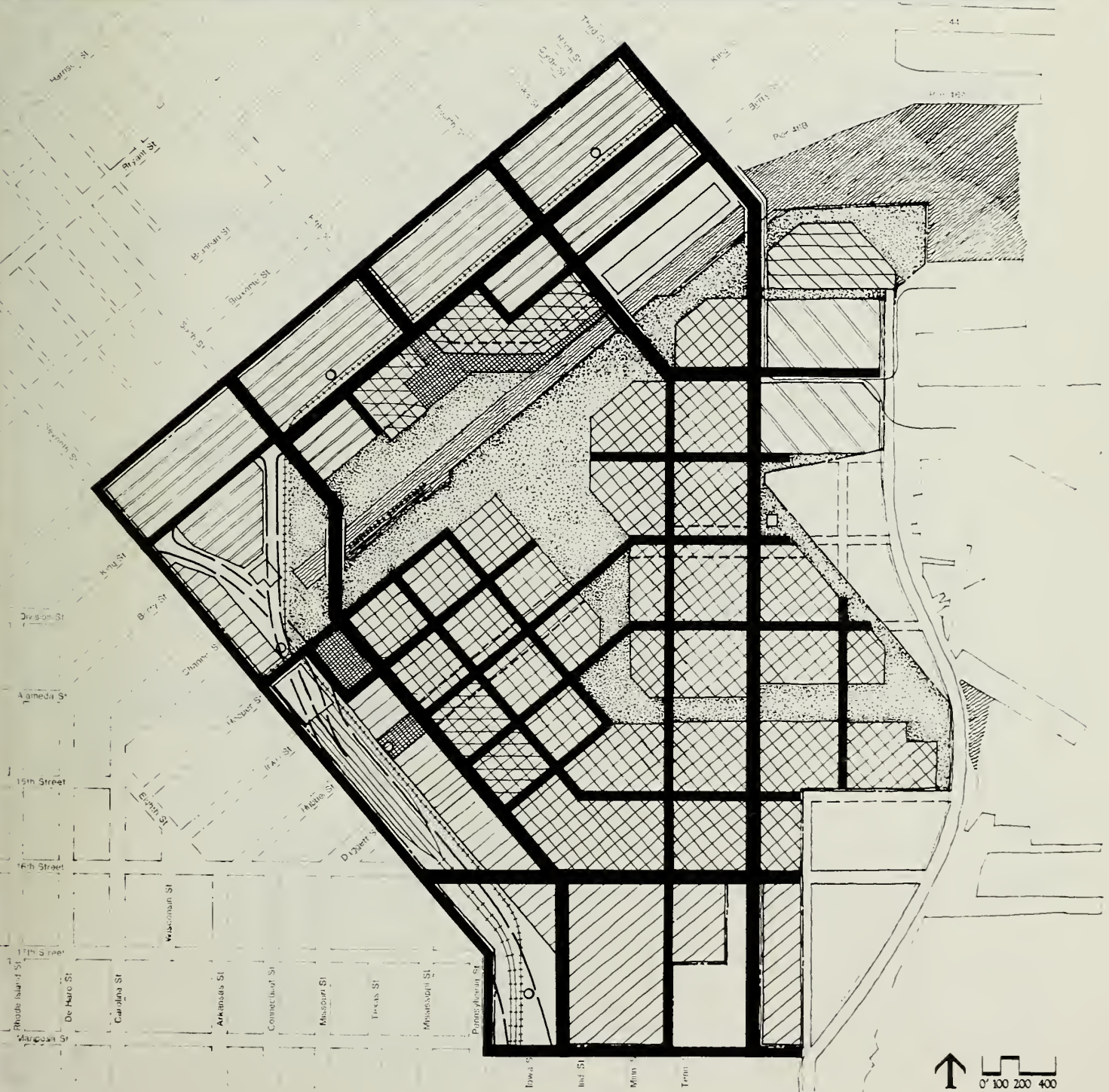
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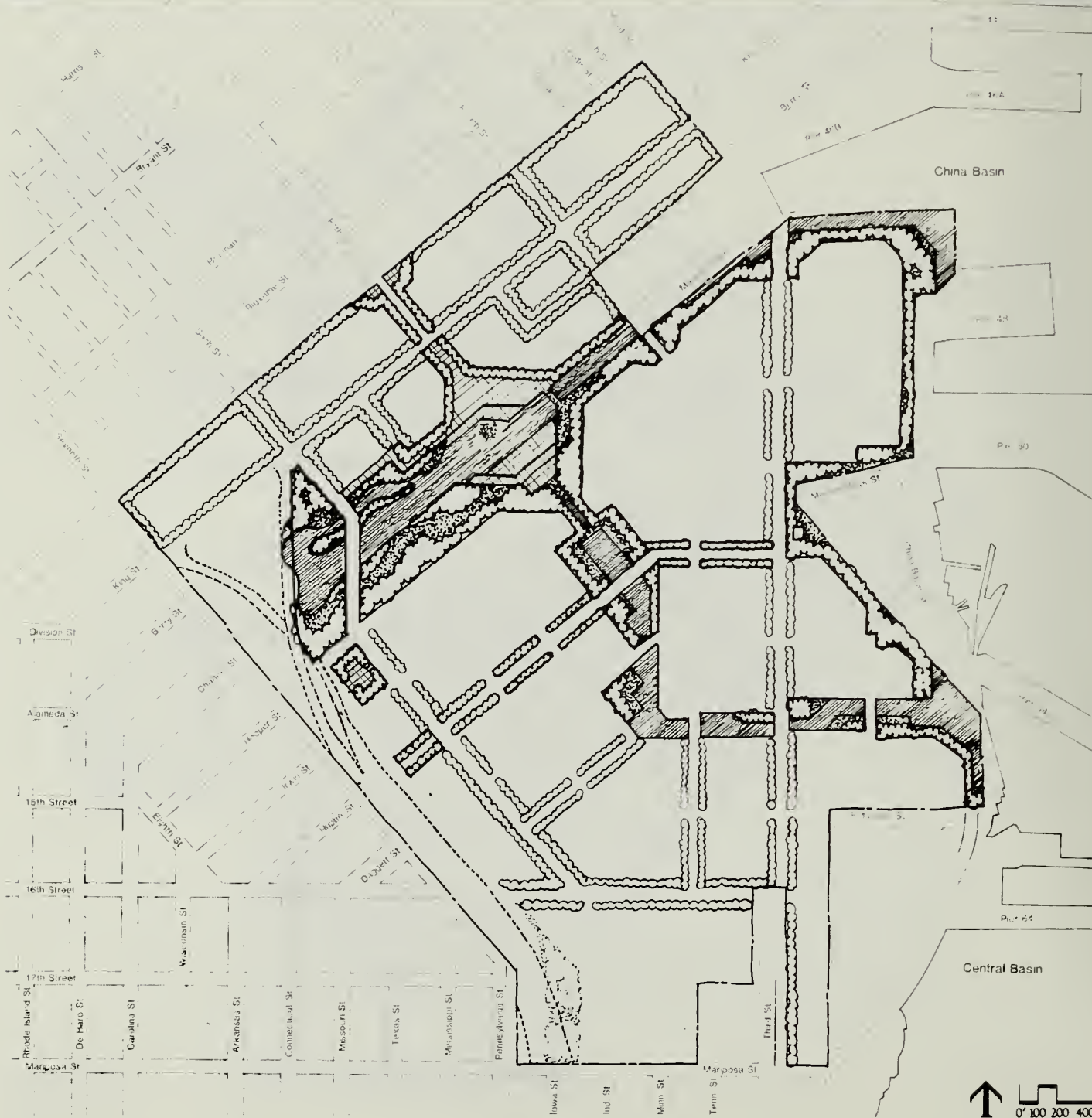
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CONCEPT C - Land Use

ALTERNATIVE

Mission Bay

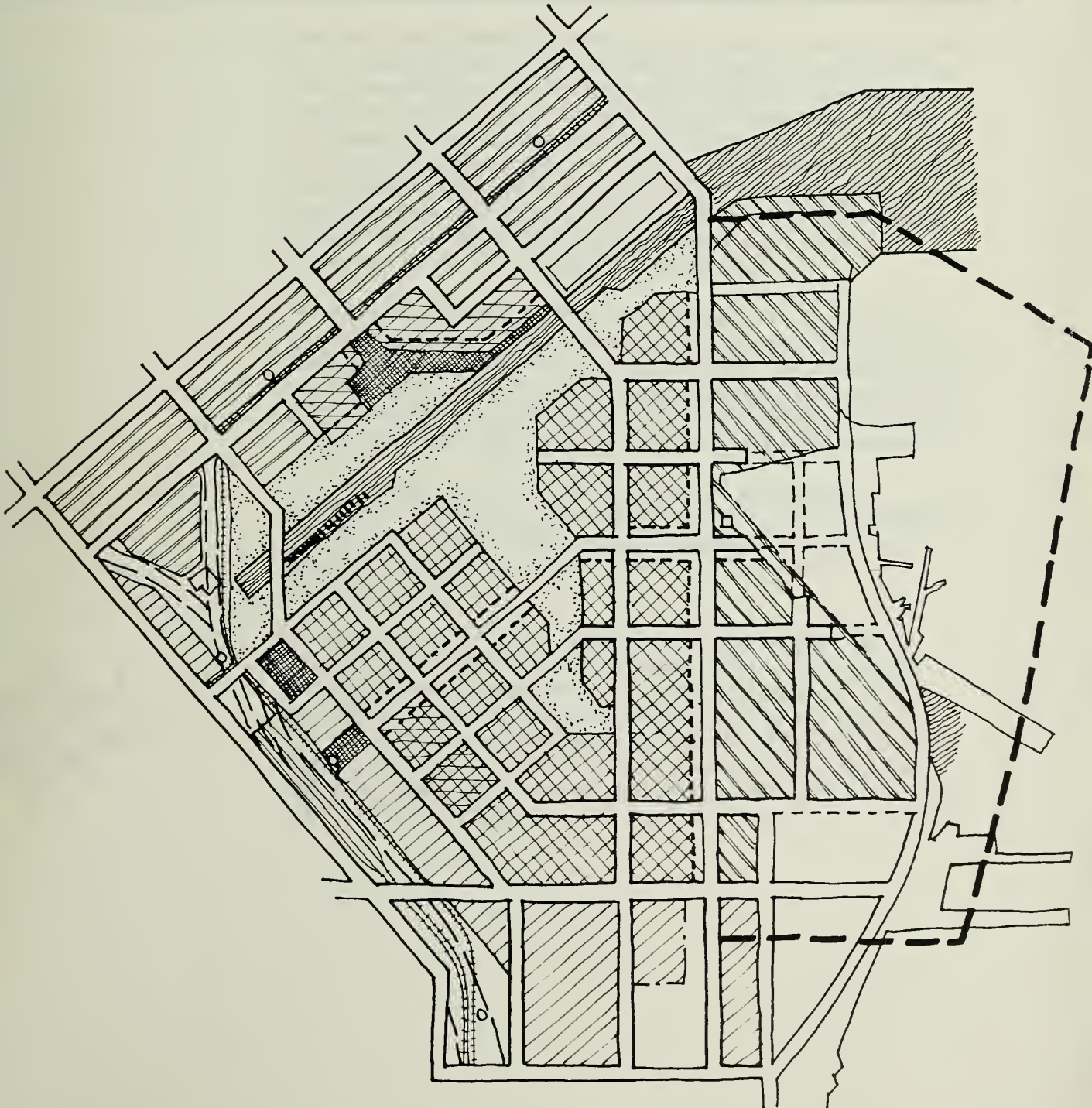
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4.0 ILLUSTRATIVE PLANS

North of the Channel, secondary office uses would occupy land on Townsend Street, with some higher-density housing along the Channel's edge. In the Channel, a wildlife environment could be provided as an amenity for Channel residents. This environment, while too small to qualify as a bona fide habitat, would represent an improvement of existing wildlife value in the Channel. Some prime residential land south of the Channel would be consumed in resolving the grid conflict. However, this area could be a highly utilized public open space, especially by nearby Mission Bay residents.

To achieve desirable numbers of housing units, housing would extend west to an Owens Street alignment of Sixth Street. The R&D buffer along I-280 would then protect residences from the adverse effects of I-280. R&D uses, perhaps in a campus-like plan, would be provided south of Sixteenth Street, in order to integrate Mission Bay with industry and housing to the south.

The northeast corner of the site could be developed for maritime or as a hotel if a wildlife environment is provided in the Channel itself. The northern China Basin edge of this corner is preferable for a hotel because of the siting opportunities.

Concept C west of Third Street would be oriented west or inward toward the central open space, making this concept compatible with implementation of the proposed container terminal utilizing all land adjacent to this site yet east of Third Street. Uses on the western side of Third Street should then be revised, to serve as buffers to Mission Bay housing. The open space system would probably not extend across Third Street to the Bay's edge.

(need
main time
graphic)

4.0 ILLUSTRATIVE PLANS

4.4.3 Open Space

This concept would resolve the conflicting South-of-Market grid and Third Street grid confrontation, with the open space system, in a functional, playful and enticing way. The central open space spine begins where the extended Fifth Street axis meets Mission Creek Channel. From there, it jogs and meanders through a series of hard-edged urban spaces, each one suggesting the next, to the Bay waterfront.



A non-tidal, contained waterway through this central system could provide continuity throughout and water theme. The water would flow from the Bay north to the Channel. A movable pedestrian bridge could cross China Basin Channel to continue the connection north to South of Market and toward downtown San Francisco.

4.0 ILLUSTRATIVE PLANS

Completing the basic open space structure, a secondary corridor would cross the main spine, connecting the Metro station, to the west, through the residential community to the central spine, Third Street and the Bay waterfront beyond.



4.0 ILLUSTRATIVE PLANS

This corridor would combine a street, linear pedestrian open space treatment and neighborhood retail facilities at the street level. Commercial uses would be possible along the central spine, fronting onto the canal spaces where appropriate.



The junction of the central spine and Mission Creek Channel would form the main focus of the Open Space System. Through a dramatic water event, the canal could empty into Mission Creek. A water spire near the north side of the Channel could provide a major centerpiece, unifying both banks.

4.0 ILLUSTRATIVE PLANS

Recreational open space amenities would be largely unstructured. Structured playfields could best be afforded by decreasing the amount of maritime use on the northeastly parcel, as indicated on the accompanying partial plan or the alternate scheme. To help facilitate this change, Concept C does not include a wetland habitat per se, with its full-cycle food chain, nesting/breeding capabilities and large space requirements. It does include a smaller marsh off the north edge of China Basin Channel from midway between Fifth and Sixth Streets to west of Sixth Street.



4.0 ILLUSTRATIVE PLANS

Combining island and open water (the Channel), it would constitute a marked improvement over the existing tideland conditions and would better serve the existing bird community.

*graphic
coming*

4.0 ILLUSTRATIVE PLANS

An alternate scheme would extend the open space system somewhat by introducing narrow greenways along some street segments as shown. This would distribute greater amenity throughout the residential community by allowing more blocks to front onto open space/pedestrian ways, and would further facilitate the pedestrian network.

4.5 Associated Land Use Accounts

As indicated earlier, each concept was developed with existing conditions, objectives and policies, plan determinants and programmatic parameters in mind. The following table summarizes the resultant land accounts for each concept. The plans were developed and the resultant land uses were calculated to measure each concept against the desired program ranges. Some adjustments in the land use plans were then made to be sure the plans would show ways to meet the program.

There are still several variables. For example, the density of housing can be changed on housing blocks or uses of land east of Third Street can become employment generators not housing. Through these types of changes, the land account with a given plan can vary substantially. Further adjustments can be made as long as (a) program ranges are met; (b) exchanges of acreage between land use categories still result in a realistic mixed land use plan that meets multiple Mission Bay objectives and policies and (c) viable new locations for new land uses can be located.

The reason for extracting these land use accounts is to compare land use efficiency and illustrate the trade-offs that specific land use plans would necessitate in terms of acreage for each use. Land use efficiency and land use mix must be weighed along with design character and planning concepts during evaluation of these plans.

Table ____: Land Use Accounts for Illustrative Plans

USE	PROGRAM		ALTERNATIVES		
			A	B	C
1. Housing	7200-8500 DU	Lower Density*	78 acres 5,870 DU	67.2 5,032	73.8 5,683
		Higher Density*	12 acres 2,290 DU	19.8 2,926	11.2 1,674
		Total Housing	90 acres 8,160 DU	87 7,958	85 7,237
2. Public Open Space	64-95 acres	General Open Space**	60 acres	64	54
3. Research and Development	25-36 acres		25 acres	32	26
4. Secondary Office	22-33 acres		32 acres	28	31
5. Maritime	0-18 acres		6 acres	0	12
6. Retail (Freestanding)	0-73 acres		6 acres	0	0
7. Hotel	0-4 acres		0 acres	4	4
8. Community Facilities	2-6 acres		3 acres	3	3
9. Infrastructure	-		55 acres	57	61
10. Miscellaneous	-		18 acres	20	19
TOTALS:	-		295 acres	295	295

Notes:

* Housing counts are based on two general ranges of housing densities: a "lower" one (~~78-85~~ DU/acre) and a "higher" one (120 to 150 DU/acre). Further distinctions will be made.

** This includes nine (9) acres of Channel water areas between 1) Fourth Street and the Channel's west end, and 2) three (3) acres along the edge between Fourth and Third Streets. Twenty-three (23) additional acres of public open space are proposed in office, R&D and housing blocks.

